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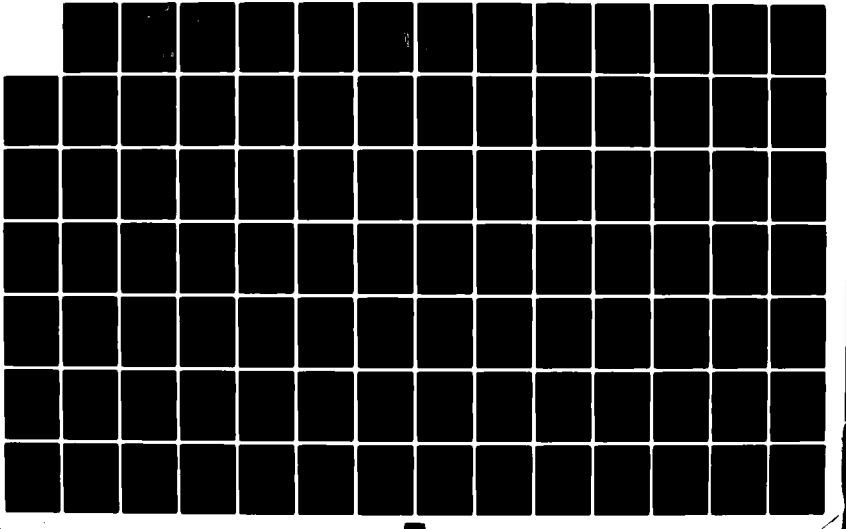

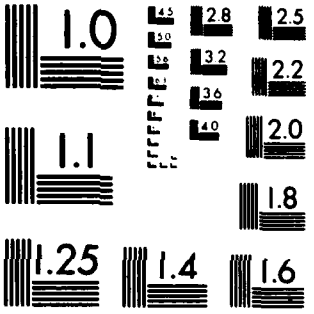

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DEVELOPMENT OF THE LIFE EVENTS SURVEY AS A MEASURING INSTRUMENT FOR STRESS RESEARCH

Captain Randle K. Bunner, USAF

LSSR 34-82

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY (ATC)
AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

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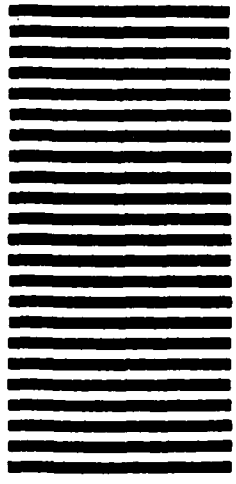

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Life Changes	Psychosocial Stress

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Thesis Chairman: Nestor K. Ovalle, 2d, Major, USAF

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Life events research has identified and continues investigation of the relationship between life events and an individual's susceptibility to illness. This relationship is explained as follows: life events as stressors, resulting from changes in family, marriage, occupation, economics, residence, personal relationships, education, religion, recreation, and health, are associated with the need for individual adaptive behavior called stress. Research has shown that this stress can take the form of various illnesses. Traditional stressor measuring instruments have been insensitive to individual and group differences. For this reason, this thesis effort developed the Life Events Survey (LES) as a stressor measuring instrument pertinent to DOD employees. The LES identifies major, minor, and continuous life events and provides data on life event frequencies, assessment of event positiveness or negativeness, and quantification of the extent of stress caused by events. The LES was administered as part of a broader methodology designed to examine the relationships of individual and organizational variables to coronary heart disease. Analysis indicates LES events are significantly correlated and appear to capture the major, minor, and continuous life events concepts. Recommendations are made for further examination of the relationship of these concepts to perceived stress and coronary heart disease.

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DEVELOPMENT OF THE LIFE EVENTS SURVEY AS A MEASURING INSTRUMENT FOR STRESS RESEARCH

A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Engineering Management

By

Randle K. Bunner, BSCE
Captain, USAF

September 1982

This thesis, written by

Captain Randle K. Bunner

has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirements for the degree of

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CHAPTER 1

INTRODUCTION

> . . . in the United States . . ., the technological advances made since 1945 have produced profound alterations in society and exerted mounting pressures on the family and its constituent members. The rate of changes now taking place in every field is becoming too rapid for the human mind to absorb, yet the ordinary individual is powerless to reduce the speed of the process or to exert any decisive influence over events [19:1].

This increasing rate of change caused by the social events in peoples' lives is what Alvin Toffler popularized as Future Shock in his book of the same title. Toffler defined Future Shock (49:326) "as the distress, both physical and psychological, that arises from an overload of the human organism's physical adaptive systems and its decision-making processes." Not surprisingly, this definition closely resembles the definition of stress given by Rabkin and Struening (35:1014): ". . . the organism's response to stressful conditions or stressors, consisting of a pattern of physiological and psychological reactions, both immediate and delayed."

These physiological and psychological reactions do not occur in specific patterns, but rather require individuals to adapt in a number of different forms (56:252). The more familiar outcomes related to stress reactions are job absenteeism and turnover, alcoholism, accidents, the onset of

a variety of illnesses, and death (7:571; 56:252). These stress-related outcomes have become very costly to our society. In 1974, approximately 5.9 million injuries and illnesses occurred in private sector U.S. industries and resulted in the loss of an estimated 31.1 million workdays (equivalent to the annual output of 125,000 employees) (31:4). The total cost of all U.S. accidental injuries in 1977 was $62 billion, including 18.3 billion for wages lost and 7.5 billion for medical expenses (31:4,5). More dramatically, Table 1 lists the major causes of death in the U.S. with heart disease leading the list. In 1976, the American Heart association estimated the annual cost of cardiovascular disease in the U.S. at $26.7 billion (7:571).

Table 1

Leading Causes of Death in U.S. All Ages, 1978
(Adapted from 30:7-90,7-144; 31:8; 52)

Heart Disease	729,510
Cancer	381,085
Cerebrovascular Disease	190,509
Accidents	105,600
Suicides	27,300
Homocides	20,400

The percentage of these figures that are directly or indirectly attributable to stress are difficult to determine. The magnitude of the figures, however, are significant

reasons for the growing concern over the costly impact stressors have on our lives and the business community. Empirical evidence (refer to Literature Review) has shown that stressors in the form of accumulated life events (refer to Appendix A) over relatively short periods of time can increase an individual's stress (refer to Appendix A) and consequently increase the risk of chronic illness (16:66). As a result of this evidence, a body of knowledge called life events research (35:1013; 3:189) has developed over the past 80 years. This research has identified and continues investigation of the relationships between life events and an individual's susceptibility to illness (35:1016).

One of the primary requirements for conducting life event research is the measuring instrument. This instrument identifies the specific life event stressors, and when administered as part of a broader methodology, the instrument provides a measurement of the magnitude of stressors an individual is experiencing. A number of instruments and methodologies have evolved (refer to Literature Review); however, all were derived from the early research of Holmes, Hawkins, and Rahe. In 1957, Holmes and Hawkins constructed the first edition of the Schedule of Recent Experience (SRE) (refer to Appendix A) for studying life change events and the onset of tuberculosis (36:96; 40:40). The SRE, revised into its present form by Homes and Rahe in 1964, provided the first systematic approach for identifying life change

events and their frequency of occurrence (18:214). In a separate but related study in 1966, Holmes and Rahe developed the Social Readjustment Rating Scale (SRRS) (refer to Appendix A and B) (18:215; 36:97). The SRRS assigned a normative magnitude to the life events identified by the SRE, and the combination of the two provided a quantitative basis upon which all subsequent life event research has depended.

The intent of the SRRS was to provide a normative scaling instrument that could be applied across differing social groups and cultures. A number of studies (refer to Literature Review) initially provided support for the validity of generalizing both the SRE and the SRRS to all sample groups. Subsequent studies (refer to Literature Review), however, revealed there existed sufficient variance between people and their life events to prohibit the generalization of the SRRS.

The SRRS was also developed based on the amount of perceived change in an individual's status quo as a result of the occurrence of life events. Several studies (refer to Literature Review) indicated that by also requiring an individual to identify life event change as being either positive or negative, the ability to predict illness onset was enhanced. Still other studies (refer to Literature Review) found that stressor magnitudes based on the SRRS did not predict the onset of illness (refer to Appendix A) at all.

Instruments which considered the differences between groups and individuals were generally found to be better predictors of the onset of illness. For this reason, the purpose of this research was the development of a life events research instrument which would identify those life events pertinent to employees of the Department of Defense. This instrument would also provide individual data on the frequency of life events, assessment of positive versus negative change caused by the life events, and measurement of the extent to which events caused personal stress.

The following research questions are proposed as are initial means of testing the potential utility of this new instrument:

1. What life events, unique to Department of Defense (DOD) employees, are identified most as potential causers of stress in the following categories:

    a. Major life events?
    b. Minor life events?
    c. Continuous life events?

2. What life events are most stressful to DOD employees in the following categories:

    a. Major life events?
    b. Minor life events?
    c. Continuous life events?

3. What life events are most significantly correlated in the following categories:

    a. Major life events?
    b. Minor life events?
    c. Continuous life events?

CHAPTER 2

LITERATURE REVIEW

The purposes of the literature review were to: (1) describe the historical development of life events research; (2) examine the early and basic methodology used in this research; (3) identify the primary methodological modifications needed for current research techniques; and (4) provide a critical review of the current methodology. This review will set the stage for development of a new life events research instrument.

Early Development of Life Events Research

Life events research had its origin shortly after the turn of this century with Cannon's clinical observations that bodily changes were related to pain, hunger, and the major emotions (8:2; 35:1016). These observations showed that stimuli (in the form of stressful life events) associated with aroused emotions could cause changes in basic physiological functions (8:3). While Cannon's observations supported the contention that stressful life events could be physically harmful, the link between life events and specific illnesses had not yet been established (8:3).

A major contribution to the establishment of this link was made by Meyer in the 1930s (8:3; 16:70). Meyer

kept life charts on hospital patients for use in making medical diagnoses (8:3; 35:1016). The life chart method required the documentation of life events including:

> . . . the changes of habitat, of school entrance, graduations, or changes, or failures; the various 'jobs'; the dates of possibly important births and deaths in the family, and other fundamentally important environmental incidents [8:3].

The results of life charting revealed that patient health changes occurred when clusters of life changes occurred (16:70; 35:1016). More specifically, life charting showed that life events were important components of the cause of growth, development, metabolism and genital disorders; headaches; and eye, respiratory, skin, stomach, colon, muscles, joints, periarticular structures (refer to Appendix A), and heart disease (8:3). Meyer's research strongly linked life event stressors to the occurrence of various illnesses, but how the two were related required further explanation.

In 1936, Seyle's conception of the general adaptation syndrome (GAS) further explained the relationship between life events and the onset of illness (35:1016; 45). GAS was defined as an organism's nonspecific response to external stressors (1:2; 45:38). This syndrome evolved through three stages: alarm reaction, resistance, and exhaustion (refer to Figure 1) (1:2; 45:38). When confronted by life event stressors, individuals enter the first stage and, their overall resistance to the stressor initially decreases until their biological defenses begin to mobilize

(1:2). During the second stage, the biological defenses are fully mobilized and the individual adapts to the stressor without physical harm (1:3). Adaptive capacities are finite, however, and in the presence of additional stressors or chronic stressors, the individual's resistance is exhausted and illness or death can occur in stage three (1:3). The primary emphasis of the GAS was that the individual's response was characterized by a measurable increase in pituitary and adrenal hormone output, which improved the mobilization of bodily defenses (1:1,2).

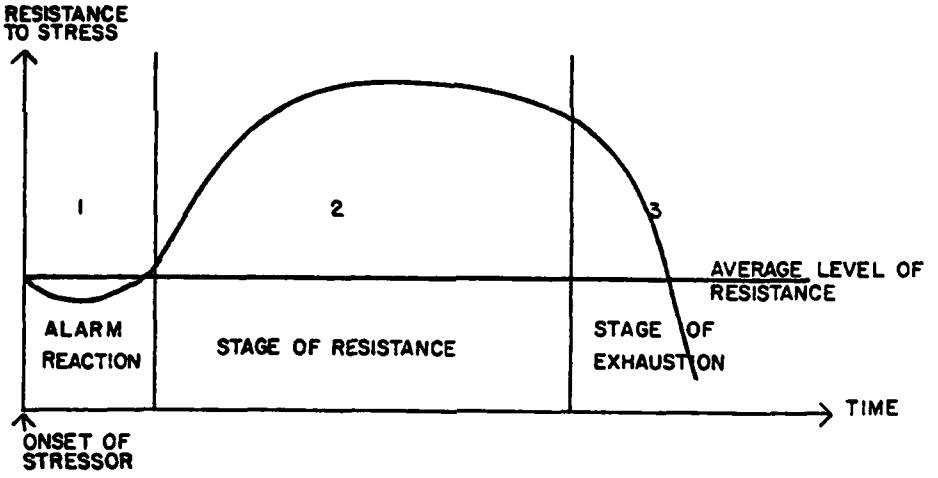

Figure 1. The General Adaptation Syndrome (Adapted from 1:2)

Selye's strictly biological and generalized approach to the stress response was challenged. Also in the 1930s, Alexander and his colleagues produced evidence of a relationship between personality characteristics and selected

organic syndrome within the framework of psychosomatic theory (35:1013). As a result, current life events research views the stress response as a complex, interrelated process involving many psychological and physiological factors in addition to antecedent life event stressors (1:5,6; 36). Within this broader stress response process, Wolff expanded on the life charting work of Meyer by studying the patient life settings and emotional states surrounding specific illensses and symptoms (16:71,56).

Early Methodologies

In his book, Stress and Disease (56), Wolff described the methodology used to examine the nature and consequences of adaptive stress response. This methodology involved three elements: the patient, the technical procedures, and the various measuring instruments.

Wolf explained that most subjects for life event research were randomly selected patients from medical sub-specialty clinics, and these subjects normally became patients under the medical care of the investigator (56:13-14). Volunteers were avoided whenever possible to negate any distortion of results caused by an individual's personality peculiarity. Finally, patients possessing extreme manifestations of a disease were often used in special studies.

The technical procedures used to measure adaptive stress responses in this early methodology were numerous (56:15-16). These procedures included:

> . . . controlled pressures, temperatures, measurements of viscosity and electrical resistance; biochemical studies of the blood, urine and tissue fluids; photography, mechanical and electronic recording of the movements of hollow viscera and of pulsation of vessels; along with the various implements of the neurosurgeon , otolaryngologist, opthalmologist and urologist [56:15].

Great care was required to ensure patient participation was not disturbed by equipment adjustments and maintenance during research sessions. Also, investigators had to possess creative imagination and a corporate medical knowledge. These characteristics permitted identification and investigation of the adaptive stress responses measured by the technical procedures. Ultimately, these responses acted as cues which might have led to possible new knowledge.

Finally, patient diaries, checklist questionnaires, and stress interviews were the instruments used in this early methodology (56:20-22). The diaries and checklist questionnaires were used in identifying reactions to daily events, detecting individual emotional disorders while screening large numbers of patients, and identifying pertinent situations to individuals' symptoms and bodily changes. The stress interviews were conducted when temporary correlations had been shown between life events and illness. Under experimental conditions, the patient was verbally led by the interviewer from a calm state to a mental reoccurrence of the suspected causal event. Bodily changes occurred and were technically measured during this period. The interview was completed when the interviewer would become supportive

and return the patient to the initial serene state. The positive results of stress interviews supported the theory that pertinent life events were correlated to specific symptoms of illness.

Wolff saw a need to understand the individual's personality to properly correlate illness with responses to life events (56:18-20). Thus, stress interviews gave special attention to social relationships on and off the job; education; family background; intelligence; talents; mobility; social position; the demands, values, standards and actions of family members, and work superiors; group preferences and prejudices; and other common individual personality traits. During stress interviews, attention was not only focused on life events and the patients' bodily responses, but on the individual's integrative process as well. Wolff believed that life events evoked unconscious emotions and stress in the individual. Bodily responses then were derived from the individual's conscious and unconscious evaluation of the life event experience and not the event alone.

Wolff viewed examination of the integrative process as an improved method of defining the nature of life events, stress, and disease (56:16-18). This process was termed the ecological approach to life events research and indicated the possible correlation between cultural, social, dietary, climatic and meteorological events, and pathogenic processes

(56:26). According to Wolff, "progress for the future requires breadth of study of the group and depth of study of the individual [56:27]."

The SRE, SRRQ, and SRRS

Immediate progress for life events research primarily involved an in-depth analysis of the group rather than the individual. This analysis began with the development of the SRE for a study by Holmes and Dawkins in 1957 (36:95). In that study, the SRE was used to document information pertaining to a variety of psychosocial phenomena involving residence; occupation; social, marital, and health status; and personal and economic factors (40:42). The study revealed that a number of life changes occurred repeatedly and clustered in the two-year period prior to the onset of tuberculosis (16:70; 40:42). In similar studies reported by Rahe (40:35-43), the SRE was administered to patients suffering from heart disease, acute skin disease, and inguinal (near the groin) hernias. All patients were found to experience an increased pattern of social stressors in the form of life events two years before their illnesses. It was postulated from these findings that life events were a necessary but not sufficient cause of major health changes (18: 213; 40:40).

The SRE was revised into its present form by Holmes and Rahe in 1964, and it furnished the first systematic approach for identifying the frequency of life events

(18:214). The SRE, however, only provided researchers with the numbers and types of life event stressors. A method was needed for quantifying the magnitude of these stressors and providing a quantitative basis for subsequent life events research.

Such a method was developed in a separate but related study in 1966 (18:215; 36:97). In that study, a paper and pencil test was administered to a convenience sample of 394 middle class but socioculturally different subjects. The test consisted of a questionnaire called the Social Readjustment Rating Questionnaire (SRRQ) (refer to Appendix A), which listed 43 empirically derived life stress events. Subjects were instructed to rate each event, on the basis of their total experience, as to what they believed was the average intensity and length of time needed to adjust to the event. The rating scale ranged from 0 to 1000, and the life event of marriage was arbitrarily rated at 500 as a guide. The resultant ratings were called life change units (LCU) (refer to Appendix A) and were equal to the normative sample (refer to Appendix A) mean value of each event divided by 10. It must be noted here that these SRRQ values were based on a perceived change from the subject's status quo and are operationally defined as being independent of any individual psychological meaning, emotion, or social desirability of the life events involved (18:214; 35:1017). The list of life events, their ranking, and their

LCU values based on the original study sample are referred to as the Social Readjustment Rating Scale, and it is shown in Appendix B.

The Basic Life Events Model

The basic assumption of this early research was that life events resulting from changes in family, marriage, occupation, economics, residence, group and peer relationships, education, religion, recreation, and health do occur, and each life event is associated with the need for a change through some adaptive or coping behavior called stress (18: 216). The life events which lead to the need for adjustment or stress are quantifiable by summing the LCU values for all events occurring during a specified time period to obtain a total LCU (TLCU) (refer to Appendix A) value. This procedure is called scaling, and it provides the researcher with a stressor indicator score (refer to Appendix A). Researchers then hypothesized that this score was correlated with stress and through analysis could predict the onset of illness. This hypohtesis became the foundation of the basic life events model shown in Figure 2.

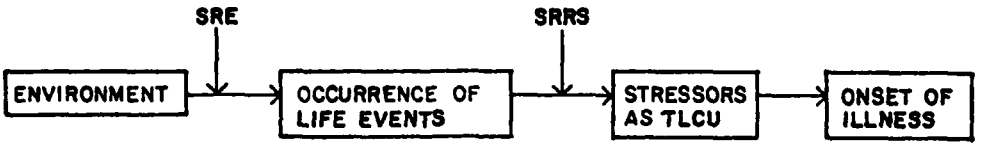

Figure 2. Basic Life Events Model

Validating the Methodology

Development of the SRE and SRRS was based on prior research evidence that had shown man can reliably quantify certain psychosocial and psychophysical experiences (18:217). Before any sound life event research could be expected then, the validity of the SRE and SRRS had to be established. Mendels and Weinstein conducted an independent evaluation of the SRE and SRRS (29:527-531) with 187 medical students. The students were divided into four subgroups. Two subgroups were administered the SRE and SRRQ exactly as the original Holmes-Rahe group had been, and the other two received no discussion with respect to personal experience with readjustment behavior. The results showed considerable agreement between these subgroups and the original Holmes-Rahe normative group despite age, life style, and level of education differences. Although relative event rankings were very similar, there were differences in the LCU ranking scores. These differences were accounted for by the previously mentioned differences between the groups. Despite the scoring differences, the agreement between the heterogenous groups supported the use of the SRE and SRRS in future studies.

The SRRS underwent further extensive analysis. In 16 comparisons of LCU values resulting from SRRQs administered to groups differing in age, sex, marital status, education, social class, generation American, religion, and

race, Pearson's r correlation coefficients were extremely high, averaging r = .945 (17:219). Further statistical analysis provided support for the validity of using the SRRS to obtain subjective LCU estimates, and that when these estimates are made for psychosocial events, the resultant SRRS is a ratio scale (17:225). Three additional cross-cultural studies (14:391-400; 15:227-237; 38:191-195) compared LCU values between Americans, French, Belgians, Swiss, Japanese, Danes, and Swedes. All three studies showed a high correlation of rank ordering as summarized in Table 2.

Table 2

Cross-Cultural Pearson Correlation Coefficient Comparisons (adapted from 8:56)

Cultural Group	1	2	3	4
1. American	1.000	.752	.884	.798
2. Japanese		1.000	.844	.816
3. Western European[1]			1.000	.772
4. Black Americans				1.000

[1]Western European group is composed of French and French speaking Belgians and Scandinavians.

Despite the high correlations, differences in culture and living conditions were reflected in differing LCU values. For example: life events of *detention in jail* and *minor violations of the law* were scored higher by Japanese than Americans because of their greater concern with obligation

to the family and the threat of external disapproval (15: 236). Similarly, Americans scored the occurrence of conflict with a spouse higher because the Japanese marriage roles are more clearly defined (15:236). These differences in LCU values provided early evidence that perhaps the SRE and SRRS could not be generalized across cultures or even within cultures due to the variance among all peoples.

Support for the Basic Model

The research discussed above indicates conflicting support for the validity of generalizing both the SRE and the SRRS to all group samples. Despite this conflict, three early studies used both tools for quantifying stressors in the basic life event model and determining the relationship between life events and the onset of illness.

In 1970, Rahe and others conducted a prospective study (39:401-406) of 2664 men aboard three Navy cruisers during their separate six to eight month deployments. TLCUs were computed based on individual life change data reported for the two years prior to the deployments. After the deployments, doctors reviewed subjects' medical records and determined illness rates by counting the frequency of new illnesses contracted over the cruise period. Results substantiated a low-order positive relationship between crew members' pre-cruise TLCU values and their illness rate.

In a similar study by Cline and Chosy (6:51-53), 134 cadets entering the Wisconsin Military Academy were

administered the SRE, and TLCU values were calculated for the 18 month period prior to the start of school. A positive and significant relationship was found between TLCU values and reported health changes. Significant correlations were found between high TLCU values and health changes in the first two weeks of school as cadets adjusted to a highly artificial and stressful environment.

In the third study by Rubin and others (41:533-547), 121 Navy aviators were administered the SRE covering the 18 months prior to a six month deployment to Vietnam. TLCU values were computed using the SRRS, and the incidence of respiratory and dermatological illnesses were reliably predicted for aviators with high TLCU values.

A summary of these studies and other research accomplished within the framework of the basic life event model reveals several initial conclusions. Certain life events and illnesses cluster during certain years. Clusters of life events usually occur six months to five years prior to the onset of an illness or a clustering of illnesses. TLCU values are higher for more severe illnesses than for minor illnesses and very high for illnesses resulting in death (37:364). In general, life events were found to be a necessary but not sufficient condition for the onset of illness, and they were fairly reliable predictors of the onset of illness through the use of the SRE and SRRS tools and methodology.

A Need for Methodological Modifications

Two studies were examined, however, which did not support these conclusions. The first was a prospective study by Rubin and others of 687 enlisted crewmembers of a Navy attack carrier (42:753-757). The SRE, covering an 18 month period prior to a six month cruise, was administered to crewmembers, and TLCU values were calculated using the SRRS. These TLCU values did not predict the illnesses of crewmembers. Life event stressors were also quantified using another weighting scale. This scale was based on a stepwise multiple regression analysis of crewmember responses to the SRRQ. TLCU values computed from the revised scale were found to be good predictors of crewmen illnesses. Also, several new life events, believed to be peculiar to the military population, were added to the SRE. When used with the revised scale, these new life events improved the predictability of illness.

The second study by Totman and others (50:155-163) was also a prospective study conducted at the Common Cold Research Unit in Salisbury, England. Fifty-two healthy volunteers were administered the SRE covering the previous six month period. Tests measuring subject neuroticism and introversion were also administered. Then subjects were experimentally infected with rhinoviruses to produce colds resembling natural infections. Scores measuring infection severity were calculated based on manifestation of infection

symptoms and on the quantity of viruses shed in nasal washings. The result of multiple regression analysis of LCU values and personality trait measurements with infection severity scores were varied. LCU values were not significantly associated with symptom manifestation or virus shedding, and no significant relationship was found between neuroticism and infection severity. Totman's Change Index (stress based on a net change in activity and/or social contact) and introversion scores were, however, positively correlated with virus shedding scores and were found to independently predict illness susceptibility. This finding indicated that introverted individuals and individuals experiencing more change have an increased chance for infection.

The findings from these studies led to more significant conclusions however. Both studies provided evidence, which did not support the validity of generalizing the use of the SRE and SRRS to all sample groups. This evidence was based on the different meanings individuals placed on various life events and the different perceptions individuals held on what LCU values should be. As a result, the SRE, SRRS, and life event research methodology had to be modified by researchers to consider these differences. These modifications involved three major areas: identification of life events suited to specific sample groups, use of event scaling techniques reflecting group and individual stressor

magnitudes, and research designed to account for a variety of individual and environmental factors. Wolff's prophecy for the future progress of life events research had come true as research now began to include in-depth studies of the individual.

Modified SRE and New Life Events

The first modification to life events research methodology involved the identification of life events pertinent to specific groups. The SRE was the foundation of basic life events research and all subsequent event identifying instruments were derived from it. More specifically, a 33 life event scale was derived by Paykel for evaluating the relationship between the frequency of events and depression (32:754). A Swedish version of the SRE was used by Theorell and others to evaluate the statistical covariation between LCUs and a number of selected physiological parameters believed to be a potential clinical significance in myocardial infarction (48:505). The Life Events Questionnaire was a 138-item instrument developed by Horowitz and Rahe to apply to groups with a wider age range (4:48). A 49 event scale was used by Volicer and Volicer for quantifying the psychological stress caused by hospitalization (54:162). Two instruments were even developed for application to very specific groups. The first is Langner's 22-item screening scale and modified SRE for college students with Type A or

Type B personality traits (47:317), and the second is Anderson's Modification of the SRE, designed for use in general college populations (10:8).

Three research instruments were used as sources for life events in association with this research effort. The first was the SRRS (refer to Appendix B) based on a myriad of results which generally supported its use in life events research. The second was a 61 event questionnaire developed for a study by Paykel and others (33:340-347). In that study, the SRE was expanded to 61 events by substituting and rephrasing certain events in an effort to improve their suitability for lower social classes, eliminating events which reflected psychiatric symptoms, and splitting items which could be extremely diverse based on perceived desirability or value. The resultant questionnaire was administered to 213 psychiatric patients and 160 nonpatient relatives, and the Distress Symptom Checklist Scale (DSCS) was produced (refer to Appendix C).

The third source of life events comes from a study done by Lazarus (25:58-62). In a departure from previous life event research, Lazarus hypothesized that minor life events called hassles, in addition to major life events, could cause stress, depending on their frequency, duration, and intensity and other individual mediating factors. It was also hypothesized that other minor events called uplifts could help individuals cope under stressful situations by

acting as psychological protection. A questionnaire (this instrument has not evolved into a final form) was developed by a group of psychologists, with input from patients enrolled in a group health insurance program, to test these hypotheses. A research sample of 100 middle-aged, middle-class people (48 men and 52 women) were administered a 22-item modified SRE to measure major life events occurring during a one year period. Subjects also completed a 117-item hassle checklist and a 135-item uplift checklist by rating the frequency of occurrence and severity of checklist items on a 3-point scale. Physical and mental health questionnaires were finally administered to measure the effects of hassles and uplifts as dependent variables. Results indicated that both hassles and life events were good predictors of health problems, but that hassles were better predictors of psychological and mental health. On the other hand, results indicated that uplifts had little buffering impact on the effects of hassles on men and actually had an increased negative impact on the effects on women. While such a negative result was unexpected to researchers, it did support the early contention that change by itself, regardless of its positive or negative perception, could cause stress and subsequent illness. The ten most frequently selected hassles and uplifts as a result of this study are listed in Appendix D.

Scaling Techniques

The second major modification required for life events research methodology was the development of event scaling techniques reflecting group and individual stressor magnitudes. Early research had indicated each life event is associated with some level of stress. This stress is quantifiable by using the frequency of life events obtained from the life events instrument, or by summing the LCU values for all life events occurring over a specified time period and obtaining a total LCU value. These quantities are the stressor indicator scores resulting from application of the scaling methods described below.

The following popular scaling techniques are identified in a recent study by Cleary (5:199-207):

1. The Simple Count Method. Administration of the life events instrument results in the frequency of each of the life events that have occurred to an individual. These frequencies are summed to obtain the total count of life events, and this total is a measure of the individual's stress. If a man experienced a divorce and three minor traffic violations in a six month period, his stressor indicator score would be 4. Because the occurrence of one event is considered no worse than any other, this method is categorized as being unweighted. All other scaling methods utilize weighting to obtain stressor indicator scores.

2. The Normative Weight Method. The SRRS (see Appendix B) is called the normative scale, and the LCU values are the normative weights applied to each event. Continuing the example from above but using this scaling method, the stress indicator score would be 106 (73 LCUs x 1 divorce plus 11 LCUs x 3 minor traffic violations).

3. The Specific Group Weight Method. For this method, the SRRQ is administered to the specific group undergoing research. An SRRS is produced, but the LCU values are the specific group mean values divided by 10 instead of the normative mean values. This method provides a scale sensitive to this particular group, and stress indicator scores would be calculated based on these new LCU values.

4. The Specific Sub-Group Weight Method. This method is identical to the specific group method except that LCU values are calculated from the specific sub-group mean values divided by 10.

5. The Individual Weight Method. This method is also identical to the specific group method except that LCU values are calculated from the individual's LCU rating divided by 10.

Assessment of Scaling Techniques

With a broad range of scaling techniques to choose from, the literature had to be searched for determining how the methods compared with one another and which would provide the best stressor indicator scores for use in any life

events research methodology. Three studies were found to strongly advocate the use of the simple count method. In the first study by Lei and Skinner, the simple count method was compared to the normative weight method and two versions of the normative method, which used randomly rearranged LCU values (27:59). Study findings indicated that there was no difference between the weighted scaling methods, and that the simple count method provided the same ranking of stress indicator scores (27:61). In a similar study by Grant and others, the simple count method was compared to all four weighted methods (12:525). Study results indicated the simple count method yielded the best correlation between life events and illness onset (12:527). Finally, 19 life event experiments were evaluated by Masuda and Holmes in a study to determine the impact of group variability on the simple count method of scaling life events (28:237). Their findings showed that group variability was accounted for primarily by individual differences, but that these differences did not significantly affect the stressor indicator scores from the simple count method (28:243,247). The literature shows that the use of the simple count method has become almost standard in life events research, and it has been suggested that this method be routinely used as a utility check on all other methods (5:202).

The selection of appropriate scaling methods was found to be highly dependent on group variability, however,

in three additional studies. Hurst, Jenkins, and Rose used the simple count, normative weight, and individual weight methods in a life events research experiment with air traffic controllers (20:129-130). They found that the normative weight method reflected more on the number of life events occurring than on the impact of those events (20:139). They also found that the normative weight method was not generalizable to their experimental group, and that the individual weight method most accurately reflected an individual's stress (20:139). These findings suggest that the normative weight and simple count methods may be used interchangeably, but neither provides as accurate an indication of individual stress as the individual weight method (20: 129). In a study by Paykel, Prushoff, and Uhlenhuth (33:346-347), the specific group method was shown to be generalizable across similar groups despite some sociodemographic and individual differences. These findings again support selecting a scaling method which is sensitive to the group. Finally, the normative weight method was used with the group specific weight method in an experiment with naval aviators conducted by Rubin, Gunderson, and Arthur (41:543). In previous naval studies, the specific group weight scale developed from naval populations provided a better indicator of stress than the normative scale (41:534-535). In this study, however, the normative weight method indicated stress

better than the group specific scale because the aviator sample was closely correlated with the normative group (41: 543).

Based on the literature, all five of the scaling techniques have been used extensively, but selection of the best technique depends on the specific test group and the desired accuracy of the stressor indicator scores. If test groups are similar to the normative sample, then the normative weight method should be used. If test groups differ from the normative sample, then any of the other weighted methods can be used, with the selection of the individual weight method providing the most accurate stress indicator scores. The simple count method has also been shown to be an effective indicator of individual stress under all group conditions. The limitation of this method, however, is that it is not as sensitive to individual and group differences as the specific group, specific sub-group, and individual weighting methods. Life events researchers must base their selection of a scaling method on a careful examination of the test group and a determination of the desired accuracy of the stressor indicator scores.

The Comprehensive Life Event Model

The third major modification required for life events research methodology involved designing a methodology to account for a variety of individual and environmental factors. These factors included such things as previous life

event experience, psychological makeup, demographic variables, personality traits, illness behavior (refer to Appendix A), physiological susceptibility to events, and capacity for seeking and using coping mechanisms. Many researchers postulated that these varied factors would help explain why certain people in similar environmental settings and experiencing many of the same life events did not become ill in the same manner.

A growing number of recent research studies have attempted to substantiate this postulate. A recent study by Webb and Allen (55:89-96) attempted to determine whether there was a difference between the life events experienced by men versus women who both sought mental health treatment. They found there was no difference in the life events experienced by the men and the women 12 months prior to their entering treatment. They did find, however, that their responses to the SRE and SRRS indicated psychological and psychosociological differences which warrant consideration of sex differentiation. A recent study by Hansson (13:305-306) determined the effect of birth order on live events and how these events interfere with task performance. Hansson hypothesized that because first-born children have a tendency to utilize alternative social support systems, like family and co-workers, more than subsequent children, they would be able to cope better under stressful situations. He found that the performance of first-borns on a relevant

task was less affected by TLCU because of their need to actively maintain and use alternate social support systems. Finally, in a relevant and important study by Suls and others (47:315-319), a comparison was made of life events, perceptions of those events, and psychological distress in persons demonstrating the Type A and B behavior patterns (refer to Appendix A). A sample of college students was divided according to behavior patterns after testing. Each group was administered a modified SRE, and subjects were asked for their perception of life event desirability, expectability, causation, and whether the event required readjustment. The results showed Type A individuals are more likely to experience life events than Type B. Also, the individual's perception of life events was found to be a critical factor linking life events to stress. For Type A individuals, events perceived as undesirable, unexpected, and ambiguous in terms of whether the individual had control over the cause of the event, were significantly associated with distress. For Type B individuals, the only significant finding was life events perceived as out of their control caused them less distress.

It is generally accepted that mediating factors such as those discussed above help explain in part why evidence from many studies still show low correlations between life events and dependent variables (22:154). Life event instruments like the Life Events Questionnaire (4:48) and the Life

Events Inventory (26:60) were developed for not only considering mediating factors but also individual perceptual differences. Conflicting evidence exists, however, over whether individual perceptions of an events desirability/undesirability or positiveness/negativeness can help improve these correlations.

The following two studies are indicative of this conflicting evidence. In a previously mentioned study by Paykel and others (32:753-760), a sample of 185 depressed patients and an identically sized control group underwent an epidemiological community survey. This survey measured the frequency of occurrence of life events during the six month period prior to the onset of depression or a comparable period for the control group. The life events were derived from a modified SRE consisting of 33 events. The results compared event frequencies between groups, and it was found that the overall frequency of events in the depressives increased. This increase was also paralleled by an increased frequency of individual events for depressives. Results analysis also examined the impact of event desirability versus undesirability. While undesirable events were found to be more frequent for depressives, the results were not significant.

Conflicting results were discovered in several more sophisticated studies by Sarason and others (44:131-149). The researchers developed a 57-item pencil questionnaire

called the Life Experiences Survey. The Life Experiences Survey included 34 events from the original SRE instrument and added new events to account for the distinction between male/female or husband/wife responses which the SRE omits. Survey responses covered retrospective periods of 1-6 and 7-12 months, and respondents were asked to make ratings of ". . . the extent to which you veiwed the event as having either a positive or negative impact on your life [44:144]." A seven point scale ranging from extremely negative (-3) to extremely positive (+3) was used. Ratings were totalled separately for positive events and negative events and then added for a total change score. The objective of the Life Experiences Survey was to provide an instrument for further research on the relationships between negatively perceived change and change per se and stress-related dependent variables.

To meet this objective, the Survey was first administered to 174 male and 171 female students at the University of Washington (44:135). Positive, negative, and total mean life event scores were computed. No significant differences were seen between men and women's scores, and there was little correlation between positive and negative life change scores.

Additional studies reported by Sarason and others (44:138-139) were conducted, however, that indicated the distinction between positive and negative events play an

important role in life events research. In one study, the Life Experiences Survey was administered to 75 male and female students along with the Psychological Screening Inventory, a 130-item true-false inventory that yields maladjustment scores on alienation, social nonconformity, discomfort, expression, and defensiveness. Correlations between positive, negative, and total scores and the five maladjustment scores indicated negative scores were positively correlated with social nonconformity and discomfort. In another study, the Survey was administered to 64 male and female college students along with the Beck Depression Inventory and the Internal-External Locus of Control Scale. Results indicated negative scores were positively correlated with both depression and locus of control. Based on study results, the authors concluded that the degree of life stress can best be determined by the measurement of negative change (44:142).

As a result of these new avenues of study, researchers found the basic life event model inadequate. Life events could predict the onset of a range of illnesses; however, a variety of individual and environmental factors can affect both the occurrence of life events and the degree of stress an individual experiences. Additionally, life events were found to be related to more than the onset of illness (13: 305). Accidents, absenteeism, job performance, and job satisfaction are among many stress-related dependent variables

deserving consideration in this relationship (21:14; 22:153). Rabkin and Struening (35:1014-1016) call these influencing variables precipitating, mediating, and predisposing factors (refer to Appendix A). By considering these additional variables within the framework of the basis life event model, a more comprehensive life event model is developed as shown in Figure 3.

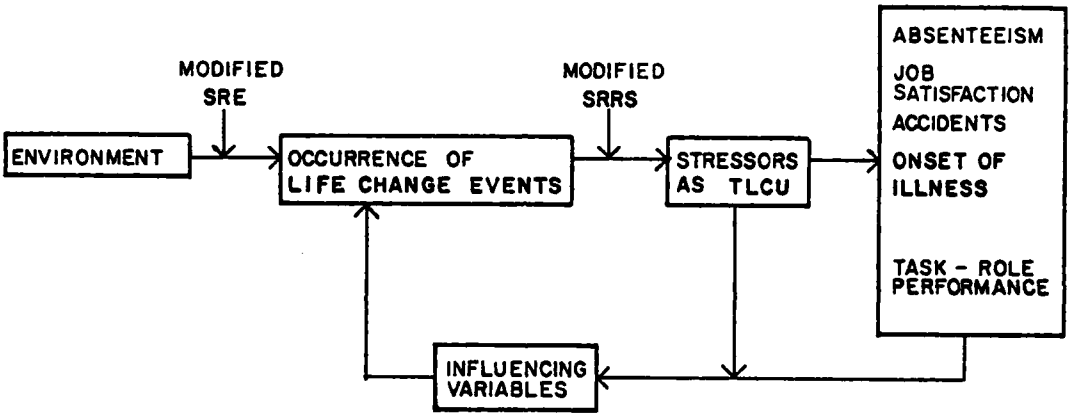

Figure 3. Comprehensive Life Event Model

This new model encompasses a multidisciplinary approach to life events research that examines the physiological, psychological, and sociological aspects of the life event--stress relationship (7:564). The comprehensive life event model does not provide the panacea for solutions to life event research, but it does provide a more realistic and flexible framework in which to conduct further study.

Criticisms of Life Event Research Methodology

This review of the literature would be incomplete without analysis of the problems experienced with the research methodology. In articles by Rabkin and Struening in 1976 (35:1016-1020) and P. J. Cleary in 1980 (5:199-207), excellent in-depth discussions are provided of the major areas of concern in an effort to help researchers improve their study designs, reporting techniques, and overall methodologies. These major areas of criticism are summarized below:

1. Test samples have not been appropriately indentified or selected. In Cleary's words (5:200): ". . . the convenience sample may have outlived its usefulness." Many of the research samples were not only ones of convenience, but they were taken from homogenous populations such as hospital and sanitarium populations, which reduced or eliminated their value in generalizing findings to other populations. Similarly, LCU values differ as sample groups differ making inference from LCU values invalid unless the test sample groups compare to those used originally in deriving the SRRS. Sample characteristics and subject selection criteria must be explicit, and LCU values must be relevant to the test sample. Thus, the reason for the evolution of the modified SRRS.

2. Life events have been used which are not always appropriate to the test sample. The relevance of life

events varies among differing sample groups. Life event lists can contain events which are confounded by the psychiatric conditions or physical illness of individuals and/or groups, or the lists may even omit events which are highly pertinent. Preliminary information on the range of life events which are relevant to the test sample are required along with follow-up questioning to ensure lists are comprehensive. This was the primary reason for the evolution of the modified SRE.

3. The physical and social conditions for collection of life event data have not been standardized. As a result, these varying conditions have confounded data reporting and decreased data reliability.

4. Event reporting has not been valid. Interviews have yielded high agreements of event reporting on trivial events only. Similarly, the event reporting instruments have resulted in poor agreement between event reporting and actual event occurrence. Retrospective contamination (refer to Appendix A) has been a major cause of invalid data reporting. Validity checks must be provided on data reporting, corroborating initial event reporting with the modified SRE. Also, a greater reliance of prospective research could solve the problem of retrospective contamination.

5. The criteria for scaling events has not always matched the causal relationship under investigation. As a

result, five scaling methods have been identified and used. The basic scale is the SRRS obtained from the original normative sample group. Modified SRRSs that have evolved include mean scale values of study respondents irrespective of group sub-classifications, mean scale values of each sub-population, and an individual's scale values. Paykel (33:340-347) developed a modified scale like the first one above based on the individual distress caused by a life event and found it useful for varied group studies. The fifth scaling method is a simple event frequency count. A study by Lei and Skinner (27:57-65) tested the outcomes from using the SRRS, a simple event frequency count, a scale based on the SRRS but with values randomly assigned, and a scale based on randomly assigned weights from 1-100. His results indicated SRRS weights were insignificant and that when computing a TLCU value on SRE derived events, a simple event frequency count is sufficient. Whatever scaling method is used, it must be clearly specified and have internal validity. It may be useful to always run a simple events frequency count as an additional check.

6. The time interval over which data have been collected has not always been stipulated nor has the interval between data collection and the occurrence of the dependent variable. This has resulted in the reporting of causal relationships which lack validity because of omitted life events.

The time intervals must therefore be carefully selected and identified.

7. The outcome measures have not always been properly documented. Researchers must be explicit in what dependent variables are chosen for measurement and provide validity checks on them.

8. The sample ranges of LCU and health data values have not always been representative of the population. As a result, values that are useful in discriminating ill subjects versus matched control subjects in a study may have no importance in identifying ill subjects from a population where the majority are not at risk of illness. The sample ranges must have external validity.

9. Descriptive statistics have not always been used for expressing relationships between LCU values and outcomes. Correlation coefficients and other appropriate statistics are needed to show the strength of association for these relationships.

10. Inferential statistics have often been poorly reported. Significance levels should be adjusted where LCU values are being tested with several dependent variables simultaneously, and the use of multivariate procedures should consider the subject-to-variable ratio as unfavorable for establishing generalized relationships when that ratio is less than four to one.

11. Finally, researchers have not always fully considered the complexity of the comprehensive life event model. The influencing variables discussed previously must be controlled or accounted for in future studies.

Conclusions

From the literature review, it can be concluded that causal relationships exist between life events and a variety of stress-related dependent variables. The instruments and associated methodologies used to define these relationships have evolved from research that concentrated on being able to generalize results between groups to research that concentrated on results peculiar to specific groups and individuals. During this evolution, five primary modifications occurred which future methodologies must consider as a minimum. First, life events used on questionnaires or other measuring instruments must occur with some degree of frequency and be applicable to the sample group. Second, regardless of the scaling technique used, the simple frequency count method should be used as a validity check. Third, respondents should make an assessment of whether life events are positive or negative. Four, respondents should make ratings of the impact events have on their lives. Finally, mediating variables should be accounted for or their impact on relationships examined if feasible. It was with these modifications in mind that the instrument used in this research was developed.

CHAPTER 3

METHODOLOGY

The purpose of this research was to develop a life event research instrument for identifying stressful life events pertinent to Department of Defense Employees. This instrument would also provide individual data on the frequency of life events, assessment of positive versus negative change caused by the events, and measurement of the extent to which events caused individuals personal stress. This instrument was used as part of a broader research effort to examine the relationships of job and personal factors to physiological components of coronary heart disease and perceived stress. The job and personal factors were measured by a questionnaire referred to as the Stress Assessment Package (SAP). The physiological components were measured through blood analysis and included total cholesterol, HDL cholesterol, and cortisol levels. The SAP and blood analysis were not directly used in the development of the life event research instrument. Their inclusion here is warranted because subsequent testing and analysis of the instrument as described in Chapter 5 will require the use of multivariate techniques to examine the relationship of life events to perceived stress and the physiological components mentioned above. The details of questionnaire

development and administration, blood analysis perceived, stress measurement, and statistical analysis are as follows.

Initial Questionnaire Development

In an earlier research effort by Fye and Staton (9), the first version of the SAP included a section for identifying stressful life events. Respondents were simply asked to list stressful events which had occurred to them in the past five years and indicate the degree of stress associated with each event according to the following scale:

1 = To a very little extent
2 = To a little extent
3 = To a moderate extent
4 = To a fairly large extent
5 = To a great extent
6 = To a very great extent

Of the 372 questionnaires completed, 58 included responses to the above query. The life events these respondents identified were arbitrarily grouped into the following categories: family, marriage, occupation, economics, religion, recreation, residence, group and peer relationships, health, social life, and education. The frequency with which each event was identified and an event rank order listing by category is shown in Appendix E. Many events identified, such as chronic and acute medical illnesses, were worded differently by individuals. These events were consolidated wherever possible to keep the total number of events relatively small and yet not lose applicability of the event to the widest possible range of group members. The final list

of stressful life events from administration of the SAP (version 1) included 92 life events.

The next step in questionnaire development required a comparison of the 92-item list to the SRRS, the DSCS, and the hassles-uplifts lists that were identified in the literature review (refer to Appendices B, C, and D). Events from the 92-item list that were common to any of the other event sources became part of the new instrument. All remaining events were consolidated wherever possible and then were examined individually to determine whether they belonged on the new instrument. As an example: *Death of a Spouse* was not on the 92-item list, yet it ranked first (according to high LCU value) on both the SRRS and SDCS. While none of the 58 respondents had experienced the *Death of a Spouse*, it was believed to apply to the DOD employees group because of its high LCU value. After this type of analysis had been made on all remaining variables, 83 life events remained for inclusion on the new instrument.

From the literature review, it was shown that two types of events were related to stress: major life events and minor life events. Major life events were those believed to cause large degrees of stress but that occurred relatively few times if any in a six month to two year period. Minor life events were those believed to cause less stress but that occurred with greater frequency over a two week period. It also became apparent during the selection of the final

83 life events that many respondents had listed events which occurred continuously. As an example: the *responsibility of being a parent* was not a single event, but rather a perceived state of mind believed to be stressful all the time. As a result of this finding, the final instrument was divided into three sections: Major Life Events, Minor Life Events, and Continuous Life Events. The final instrument was called the Life Events Survey (LES) and is shown in Appendix F.

The initial instructions for the LES required the respondent answer as follows:

1. Determine if the life event happened to you. If it did, the frequency of occurrence was to be placed in the LES booklet next to the event. If it did not, a zero was to be placed in the LES booklet (this instruction did not apply to Section 3).

2. For events that happened, determine whether the event was a positive or negative experience. The appropriate response was then to be marked on an optically read answer sheet.

3. Determine the extent to which each life event caused or would be expected to cause you stress. Responses were available from the seven point scale shown in Appendix F.

Blood Analysis

Blood samples were taken by respective base hospital lab personnel from participants in Stress Seminars conducted at test bases. Samples were sent to USAF School of Aerospace Medicine (USAFSAM/NPG), Brooks AFB, Texas, for analysis. Blood plasma was analyzed for total cholesterol, HDL cholesterol, and cortisol.

Perceived Stress Measurement

The SAP was administered at the Stress Seminars. Question 118 measured the respondent's perceived level of stress experienced in the job environment based on response to the following statement: *I feel a great deal of stress and anxiety in the performance of my job.* Responses were available from a seven point scale ranging from "not applicable" to "strongly agree."

Initial LES Administration

The LES was administered as a pre-test to 66 participants in base Stress Seminars as follows:

Langley AFB, Virginia	24
Peterson AFB, Colorado	42
Total	66

It was determined that only 31 of the 66 completed surveys could be used for analysis. Respondents were failing to mark frequencies in the booklet and confusion existed over which events required positive versus negative

assessment and "extent of stress" responses. Based on feedback from the LES administrators, the survey instructions were believed to be too complicated and unclear. The instructions were rewritten as shown in Appendix G. It was also decided that respondents' assessments of "extent of stress" caused by events, which had not happened to the respondent, could not be used for analysis of the instrument. For this reason, verbal instructions were also changed to require extent responses only on those events that happened to respondents.

Second LES Administration

The revised LES was again administered as a pre-test to 17 participants in Stress Seminars at Wright-Patterson AFB, Ohio, as follows:

Base Volunteers	11
AFIT Grad Student Volunteers	6
Total	17

It was determined that 14 of the 17 surveys could be used for analysis, but numerous violations of the instructions were still occurring on 75 percent of the surveys. Based on feedback from the LES administrators and the participants, the following problems with the instrument were found:

1. The instructions still took too long to read and were confusing.

2. The requirement to respond in the survey booklet and on the optically scored answer sheet was confusing and time-consuming.

3. The requirement to provide two responses per event on the answer sheet was confusing. Most people are conditioned to only putting one response per line.

For these reasons, the LES was completely revised as shown in Appendix H. The new instrument allowed all answers to be made directly in the survey booklet, and vastly shortened instructions prompted responses at the top of each survey page.

Final Administration

The final version of the LES was administered to 69 participants in a Stress Seminar at Randolph AFB, Texas. It was determined that 48 of the 68 surveys could be used for analysis. While this final version of the LES appeared to be an improvement over earlier versions, problems still existed. Respondents were asked to indicate negative events with an N and positive events with a P. Examples in the survey booklet all used an N and many respondents perceived this as meaning "no". Subsequently, their positive-negative responses reflected yes-no answers represented by the use of Y and N. To alleviate this problem, it is recommended that the examples in future versions of the LES use P instead of N, or change the negative-positive responses to plus (+) or minus (-) signs.

Another problem with the revised LES was the frequency of missing data. The battery of tests given during the Stress Seminars required a significant amount of time by participants. Since completion of the LES was presented as being optional, it is believed that many respondents simply grew tired of questionnaires and, therefore, failed to complete survey sections. Where missing data was encountered, surveys were not used for analysis if more than five items (frequencies, positive versus negative assessments, and extents) were missing. In summary, the data available for analysis included 93 usable surveys out of the 152 completed surveys that had been returned.

Analysis Procedures

Frequency statistics were conducted on the 93 surveys to determine which events in each section applied to the sample population, which events occurred most often, and where positive versus negative distinctions had been made. Pearson correlation coefficients were used to determine significant relationships between life events and identify those events which potentially did not belong on the LES. It is important to note here, that the Pearson Correlations are calculated using the extent of stress caused responses to the LES.

CHAPTER 4

ANALYSIS AND CONCLUSIONS

The purpose of this chapter is threefold. First, the results of the frequency analysis and Pearson Correlation calculations for each of the three LES sections will be identified and summarized. Second, the LES requested respondents to list additional life events, which they believed should have been included in the LES, along with frequencies of occurrence and positive versus negative assessments. These additional events and the results of frequency analysis will be summarized. Finally, answers will be provided to the research questions proposed in Chapter 1, and research conclusions will be outlined.

Frequency Analysis and Pearson Correlations for Major Life Events

Fifty-eight life events were included in section I. The frequencies of the percent of event occurrence and positive versus negative assessment of those events are summarized in Table 16, Appendix I. From Table 16, the results indicate each event occurred to at least one respondent, with the range of "percentage of occurrence" running from 1 percent to 81 percent. Eleven events occurred to at least half of the sample as shown in Table 3, and five of these appeared specifically related to DOD employees. The

Table 3

Rank Order of Percent of Occurrence for Top Eleven and Bottom Eight Events

Event Number*	% Occurred	Event Number	% Occurred
38	81	3	10
22	73	49	10
51	69	48	9
20	66	15	9
19	65	37	9
34	60	5	4
1	58	23	3
25	58	4	1
26	54		
21	53		
32	52		

*Refer to Appendix H for cross-reference of events to event number.

requirement for many DOD military and civilians to move and/or change jobs and be separated from families due to temporary duty assignment is reflected in the high percentage of occurrence for events 1, 19, 20, 21 and 22. Table 3 also shows the eight events which occurred to ≤ 10 percent of the sample. These events could be potential candidates for removal from the LES if the mean values of the extent to which they caused stress are low, and if it is found they are not significantly correlated to any other major life events. Finally, Table 16 shows the percentage of positive versus negative assessments for each event. All but four

events showed a distinction between an event being positive or negative: *Adoption of a Child* and *Retirement* were found to be positive experiences by 100 percent of the respondents, and *Victim of a Crime* and *Legal Problems* were found to be only negative experiences. While these assessments appear completely logical, the lack of distinction between positiveness and negativeness may also be explained by the overall low frequency of occurrence of these events.

The ranges, means, and standard deviations for both frequency counts and extents of stress caused by major life events are shown in Table 16, Appendix I. Major life events were previously defined as those which occurred relatively infrequently in a two year period, yet were assessed as being very stressful. By comparing the mean values for frequency counts to the mean values for extents of stress caused, events which may not belong in this section can be identified. Frequency count means ranged from 1.000 to 5.750 and extents ranged from 2.882 to 6.267. Any event with a mean frequency count >3.000 became a candidate for removal from the LES or movement to another section.

From Table 4, seven events were removal candidates. Event 1, *Family Separation*, was trying to capture the DOD employee who is separated from his family due to temporary duty assignments. Event 60, *Job Requires Much Travelling* captured the same thing in Section 2. A comparison of the two indicate event 60 does not occur frequently enough to

Table 4

Mean Values for Events That Are Removal Candidates

Event Number	Frequency Count Mean	Extent Mean
1	5.148	3.759
16	3.429	4.632
26	3.872	5.120
27	3.892	4.538
43	5.750	4.107
51	3.794	4.031
58	4.639	4.077

be included in Section II. Since both events have similar extent means (3.759 versus 3.722), event 1 should remain in Section I and event 60 should be dropped from Section II as being redundant. Event 16, *Sex Difficulty*, probably could not be captured in the two week limitation of Section II. Since it has a relatively high extent mean, it should remain in Section I. Events 26, 27, and 43, *Confrontation with Supervisor*, *Confrontation with Co-workers*, and *Counseling Employees*, respectively, had relatively high frequency counts and extent means and all involved the job environment. Depending on the recency of the event occurrence, these events might prove more stressful if occurring within the two week period of Section II. For this reason, events 26 and 27 should be consolidated into simply *Office Confrontation* and included in both Sections I and II along with *Counseling Employees*. Event 51, *Activities Associated with*

Holidays, could not be captured by the two week limitation of Section II, so it should remain in Section I. Finally, event 58, *Academic Efforts*, is probably captured best as a continuous life event and might be expected to be very stressful. Since event 83, *Pressures of Attending School/ Training*, covers this event already in Section III, event 58 should be deleted from the LES.

Table 5 lists the highest and lowest ten extent means from Section I. Four of the top five involve the marital relationship, and three of the remaining top ten involve health. It is interesting that only one of the top ten involves the job environment, event 26, *Confrontation with Supervisor*. Referring to Table 3, event 23, *Retirement*, had a low percentage of occurrence, yet Table 5 shows it has the third highest extent mean. For this reason, event 23 should probably remain in the LES. No pattern is apparent in the lowest ten event means.

The Pearson r correlations coefficients for the "extents of stress caused" of all 58 events in Section I are shown in Table 22, Appendix J. All events except events 4, 5, and 23 are significantly correlated with at least one other event. The lack of correlation here is explained by the fact so few respondents indicated these events occurred (refer to Table 16). A summary of each events significant correlation are given below. Only significant patterns will be discussed. Since event numbers are going to be

Table 5

Highest and Lowest Ten Extent Means

Highest		Lowest	
Event Number	Extent Mean	Event Number	Extent Mean
11	6.267	55	2.882
12	5.929	56	3.517
23	5.667	50	3.571
17	5.600	39	3.600
14	5.563	35	3.684
44	5.414	25	3.704
46	5.205	5	3.750
42	5.161	1	3.759
26	5.120	53	3.800
45	5.056	38	3.840

used in the interest of space, refer to Appendix H as a cross-reference for event names.

Event 1, *Family Separation*, is positively correlated with events 2, 6, 15, 17, and 38 with coefficients ranging from .34 to .89. All of these events deal with the family or marriage situation. Event 1 is negatively correlated with events 18 and 32 with coefficients ranging from -.43 to -.84. As more stress is experienced due to family separations, stress is reduced in extramarital affairs (perhaps because of the security of having another partner) and in large financial investments (perhaps because those investments are out of sight and therefore out of mind when one is away from the family).

Event 2, *Change in Number of Family Get-togethers*, is positively correlated with events 8, 15, 19, and 38 with coefficients ranging from .41 to .86. Three of the events logically involve the family or marriage unit and one involves a change in jobs. Event 2 is negatively correlated with events 7, 41, and 44 with coefficients ranging from -.75 to -.88. It would seem the stress of pregnancy, house damage and the death of a close-one changes inversely to the stress caused by a change in family get-togethers.

Event 3, *Birth of a Child*, is positively correlated only with events 7, 27, 34, and 53 with coefficients ranging from .85 to .94. The birth of a child seems to affect the stress experienced with co-workers (perhaps because one is

absent from work more or talks about the child a great deal), and the family income because it must be spread thinner.

Events 4 and 5 are not significantly correlated with any other events as explained above.

Event 6, *Offspring Leaves Home*, is positively correlated with event 46 with a coefficient of .89 and is negatively correlated with event 56 with a coefficient of -.82. The negative correlation is logical in that the stress of an offspring leaving home might be great while at the same time the knowledge of an offspring starting college would be gratifying and perhaps cause little stress.

Event 7, *Pregnancy*, is positively correlated with events 3, 9, 19, 22, 29, 30, 32, 34, 38, 41, 51, 52, 53, and 56 with coefficients ranging from .66 to 1.00. All 1.00 coefficients are explained by the fact the sample size was so small. Logically, the stress of pregnancy seems to exacerbate the stress involved with the family, the job environment, finances, and one's social life. Event 7 is negatively correlated with event 2 as explained above (refer to event 2).

Event 8, *Loss Experienced When Close-one Moves Away*, is positively correlated only with events 2, 21, 25, 52, and 58 with coefficients ranging from .41 to .97. The stress of event 8 seems to affect the family life, the job environment, academic efforts, and legal problems.

Event 9, *Getting Married*, is positively correlated only with events 7, 21, 34, 38, 39, 53, 55, and 57 with coefficients ranging from .66 to .99. The stress of marriage seems to exacerbate family life, the job environment, finances, and academic activities.

Event 10, *Marriage of a Close-one*, is negatively correlated only with event 46 with a coefficient of -.66. No pattern is discernable.

Event 11, *Change in Marital Relationship*, is positively correlated only with events 12, 14, 17, 19, 42, and 44 with coefficients ranging from .59 to 1.00. The stress of this event logically affects other events involved with the marriage and seems to affect the stress of changing jobs (perhaps because new jobs place a strain on the marriage).

Event 12, *Getting Divorced*, is positively correlated only with events 11 and 18 with coefficients ranging from .62 to .66. The stress of divorce affects and is affected by marital and extramarital relationships.

Event 13, *Divorce of a Close-one*, is positively correlated with event 38 with a coefficient of .63 and is negatively correlated with events 27 and 54 with coefficients ranging from -.85 to -.91. No pattern is discernable.

Event 14, *Marital Separation*, is positively correlated with events 11, 19, 22, 30, 46, and 52 with coefficients ranging from .55 to .95. Marital stress exacerbates the stress of the marriage relationship, one's job, legal

problems and medical problems. Event 14 is negatively correlated with event 48 with a coefficient of -1.00.

Event 15, *Marital Reconciliation*, is positively correlated with events 1, 2, 20, 31, 40, and 47 with coefficients ranging from .68 to .95. The stress of a marital reconciliation seems to affect the marriage and family relationships, the job, and social lives. Event 15 is negatively correlated with event 17 with a coefficient of -.87. The stress of a reconciliation seems to have an inverse affect on the stress caused by an unfaithful spouse.

Event 16, *Sex Difficulty*, is positively correlated only with events 21, 31, 43, 45, 53, 56, and 57 with coefficients ranging from .63 to .97. The stress caused by sexual problems seems to affect and be affected by the stress of home, work, and school events.

Event 17, *Spouse is Unfaithful*, is positively correlated with events 11 and 46 with coefficients of .89 and 1.00. Event 17 is negatively correlated with events 1 and 15 with coefficients of -.84 and -.87.

Event 18, *Extramarital Affair*, is positively correlated with event 12 with a coefficient of .66 and is negatively correlated with events 1 and 45 with coefficients of -.81 to -.84.

Event 19, *Changing Jobs*, is positively correlated only with events 2, 8, 11, 14, 20, 21, 22, 26, 27, 29, 30, 34, 38, 39, 40, 41, 42, 43, 51, 52, and 55 with coefficients

ranging from .29 to .73. The stress of changing jobs literally seems to affect every aspect of our lives. This is particularly significant to the DOD employee population as changing jobs is a fairly common and expected event.

Event 20, *Change in Job Responsibility*, is positively correlated only with events 15, 19, 21, 22, 26, 27, 36, 37, 47, and 48 with coefficients ranging from .36 to .95. (Refer to explanation above).

Event 21, *Change of Job Position*, is positively correlated only with events 8, 9, 16, 19, 20, 22, 25, 27, 29, 30, 31, 34, 38, 40, 46, 53, 56, 57, and 58 with coefficients ranging from .27 to .99. (Refer to explanation for event 19).

Event 22, *Change of Job Supervisor*, is positively correlated with events 7, 14, 19, 20, and 21 with coefficients ranging from .43 to .84. These correlations have already been explained above.

Event 23, *Retirement*, is not correlated with any other events as previously explained.

Event 24, *Change Careers*, is positively correlated only with events 25, 38, 40, 47, 51, and 56 with coefficients ranging from .69 to .96. The stress of this event affects the job, home, and social environments.

Event 25, *Experience Job Inspection/Evaluation*, is positively correlated only with events 8, 21, 24, 28, 29, 32, 40, 48, 50, and 52 with coefficients ranging .35 to .89.

Event 26, *Confrontation with Supervisor*, is positively correlated with events 19, 20, 27, 29, 33, 46, 48, and 51 with coefficients ranging from .30 to .76. Event 26 is negatively correlated with event 37 with a coefficient of -.87. No pattern is discernible.

Event 27, *Confrontation with Co-workers*, is positively correlated with events 3, 19, 20, 21, 26, 29, 34, 43, 44, and 46 with coefficients ranging from .32 to .81. Event 27 is negatively correlated with events 13 and 45 with coefficients ranging from -.66 to -.85. No pattern is discernible.

Event 28, *Change of Employment Status*, is positively correlated with events 25, 33, 35, and 40 with coefficients ranging from .56 to .97. No pattern is discernible. Event 28 is negatively correlated with event 41 with a coefficient of -1.00.

Event 29, *Change of Employment Status of Spouse*, is positively correlated only with events 7, 19, 21, 25, 26, 27, 30, 33, 34, 43, 46, 47, 51, 52, 56, and 58 with coefficients ranging from .45 to .98. The stress resulting from the spouse changing jobs seems to affect virtually all aspects of our lives. Again, this appears significant here because this event would be expected to occur at least each time the DOD employee was required to move.

Event 30, *Buying a House*, is positively correlated only with events 7, 14, 19, 21, 29, 31, 32, 33, 34, 35,

40, 45, and 46 with coefficients ranging from .36 to .67. The stress of buying a home seems to affect the home life, finances, changing jobs, and medical problems.

Event 31, *Selling a House*, is positively correlated only with events 15, 16, 21, 30, 34, 38, 40, 41, and 42 with coefficients ranging from .43 to .91. The extent of stress here exacerhates stress in the marriage relationship, the job, the home environment, finances, and close relationships.

Event 32, *Making Other Large Investments*, is positively correlated with events 25, 30, 33, 35, 38, 41, 42, 51, and 56 with coefficients ranging from .33 to .82. The stress associated with large financial investments affects the stress in job, home, school, and primarily financial environments.

Event 33, *Experience a Financial Difficulty*, is positively correlated with events 19, 26, 28, 29, 30, 32, 34, 35, 39, 40, 50, and 52 with coefficients ranging from .45 to 1.00. Surprisingly, the stress of financial problems affects the stress in most areas except the marriage relationship. Event 33 is negatively correlated with event 54 with a coefficient of -0.44.

Event 34, *Change in Income*, is positively correlated with event 19, 21, 27, 29, 30, 31, 33, 38, 39, 40, 46, 53, 57, and 58 with coefficients ranging from .38 to .70. (Refer

to comments above.) Event 34 is negatively correlated with event 37 with a coefficient of -.87.

Event 35, *Experience a Tax Problem*, is positively correlated only with events 28, 30, 32, 33, 40, 43, 44, and 58 with coefficients ranging from .54 to 1.00. The stress of tax problems appears exacerbated by the stress of financial and educational changes.

Event 36, *Change in Commitment to Church*, is positively correlated to event 20 with a coefficient of .56 and negatively correlated to event 52 with a coefficient of -1.00.

Event 37, *Change in Religious Beliefs*, is also positively correlated to event 20 with a coefficient of .90 and negatively correlated with events 26 and 34 with a coefficient of -.87 for both.

Event 38, *Vacation*, is positively correlated with events 1, 2, 7, 9, 13, 19, 21, 24, 31, 32, 34, 39, 40, 47, 51, 52, 56, and 57 with coefficients ranging from .27 to .87. The stress of a vacation appears to affect the stress in all areas of our lives. Event 38 is negatively correlated with event 54 with a coefficient of -.37.

Event 39, *Change in Recreation Routine*, is positively correlated with events 9, 19, 33, 34, 38, 42, 51, 53, and 55 with coefficients ranging from .38 to .88. Event 39 is negatively correlated with events 46 and 54 with coefficients of -.58 and -.39. No patterns are discernible.

Event 40, *Required to Move*, is positively correlated with events 7, 15, 19, 21, 24, 25, 28, 30, 31, 33, 34, 35, 38, 44, 46, 47, 50, and 52 with correlations ranging from .38 to .86. Agian, the stress resulting from a requirement to move is pervasive in its affect on the stress caused by all other areas of our lives.

Event 41, *House Damaged*, is positively correlated with events 19, 31, 32, 42, and 51 with correlations ranging from .59 to .73. The stress of house damage seem to affect the stress of changing jobs, financial changes, close relationships, and holiday activites. Event 41 is negatively correlated with event 28 with a coefficient of -1.00.

Event 42, *Change in Relationship With a Close-one*, is positively correlated with events 11, 19, 31, 32, 39, 41, 47, and 56 with coefficients ranging from .40 to .59. Event 42 is negatively correlated with event 45 with a coefficient of -.73. No patterns are discernible.

Event 43, *Counseling Employees*, is positively correlated only with events 16, 19, 27, 29, 35, 46, 49, and 52 with coefficients ranging from .44 to .83.

Event 44, *Death of A Close-one*, is positively correlated with events 11, 27, 35, 40, and 51 with coefficients ranging from .43 to 1.00. The stress caused by the death of a close-one was associated with the stress of changes in marital relationships, finances, residence, job relationships, and holiday activities. While this impacts almost all

areas of our lives, its surprising to see correlations with only five other events. Event 44 is negatively correlated with event 2 with a coefficient of -.75. Why this correlation is negative is difficult to explain. It is suspected that the positive versus negative assessment of events is clouding this relationship.

Event 45, *Acute Personal Medical Problem*, is positively correlated with events 16 and 30 with coefficients of .85 and .61. No pattern is discernible. Event 45 is negatively correlated with events 18, 27, and 42 with coefficients ranging from -.66 to -.81. No pattern is discernible.

Event 46, *Acute Medical Problem of A Close-one*, is positively correlated with events 6, 14, 17, 20, 21, 26, 27, 29, 30, 34, 40, 43, and 51 with coefficients ranging from .31 to .89. No pattern is discernible, yet the stress involved with this event affects the stress caused by relationships, home, work, financial, and social activities. Event 46 is negatively correlated with events 10 and 39 with coefficients of -.66 and -.58. An increase in stress due to the event is associated with a decrease in stress due to a change in daily routine. This appears logical since an injury could stop a stressful daily routine from occurring.

Event 47, *Change in Social Participation*, is positively correlated only with events 15, 20, 24, 29, 38, 40, 41, 52,53, 55, 56, and 57 with coefficients ranging from

.36 to .95. No discernible patterns were found.

Event 48, *Victim of A Crime*, is positively correlated with events 25 and 26 with coefficients of .89 and .76 and negatively correlated with events 14 and 58 with a coefficient of -1.00 for both. No pattern is discernible.

Event 49, *Close-one Is A Victim of A Crime*, is positively correlated with events 33 and 43 with coefficients of 1.00 and .83 and is negatively correlated with events 54 and 57 with coefficient of -.93 and -.88.

Event 50, *Socializing With High Officials*, is positively correlated only with events 25, 40, and 52 with coefficients ranging from .59 to .80. No pattern is discernible.

Event 51, *Activities Associated With Holidays*, is positively correlated only with events 7, 19, 24, 26, 29, 32, 33, 38, 39, 41, 43, 46, and 56 with coefficients ranging from .30 to .85. As might be expected, the stress caused by this event affects the stress caused by home and job environments and finances.

Event 52, *Legal Problems*, is positively correlated with events 7, 8, 14, 19, 25, 29, 40, 43, 47, 50, and 58 with coefficients ranging from .31 to .87. Although no pattern is apparent, the stress of legal problems is exacerbated by all aspects of our lives. Event 52 is negatively correlated with event 36 with a coefficient of -1.00.

Event 53, *Outstanding Personal Achievement*, is positively correlated with events 3, 7, 9, 16, 21, 34, 38,

39, 47, 51, 55, 56, and 57 with coefficients ranging from .37 to .94. Again the stress of this event affects many aspects of our lives, particularly academics.

Event 54, *Starting School/Training*, is negatively correlated only with events 13, 32, 33, 38, 39, and 49 with coefficients ranging from -.37 to -.93. As might be expected the stress of furthering one's education is associated with the stress of changed home environment, finances, and daily routine. The reason this is a negative correlation might be explained by the fact that school involves so much of the individual's time that stress caused by these other events is reduced.

Event 55, *Graduating from School/Training*, is positively correlated only with events 9, 19, 39, 47, 53, 56, 57, and 58 with coefficients ranging from .53 to .95. As might be expected, the stress from graduating is associated with the stress of changing jobs, home and social lifestyles, and daily routine.

Event 56, *Close-one Is Starting School/Training*, is positively correlated only with events 16, 21, 24, 29, 32, 38, 42, 47, 51, 53, and 55 with coefficients ranging from .37 to .96. The stress of a close-one starting school/ training affects the stress in a number of expected areas: job status, finances, personal relationships, holiday activities, and a feeling of personal achievement.

Event 57, *Close-one Is Graduating from School/Training*, is positively correlated with events 16, 21, 34, 38, 47, 53, 55, and 58 with coefficients ranging from .63 to .97. The association here has already been explained above. Event 57 was also negatively correlated with event 49 with a coefficient of -.88. No pattern is discernible.

Event 58, *Academic Efforts*, is positively correlated with events 8, 21, 29, 34, 35, 52, 55, and 57 with coefficients ranging from .38 to .79. No discernible pattern is apparent. Event 58 is negatively correlated with event 48 with a coefficient of -1.00.

Frequency Analysis and Pearson Correlations for Minor Life Events

Ten life events were included in Section II. The frequencies of the percent of event occurrence and positive versus negative assessment of those events are summarized in Table 17, Appendix I. From Table 17, the results indicate each event occurred to at least 17 respondents, with a range of "percentage of occurrence" from 19 percent to 58 percent. Based on these figures, the ten events seem to capture the minor life events that occur to DOD employees. Table 17 also shows that distinctions were made between the positiveness and negativeness of all events in this section.

The ranges, means, and standard deviations for both frequency counts and extents of stress caused are shown in Table 20, Appendix I. Minor life events were expected to

have a greater frequency count over a two week period and of course be stressful. Events with frequency count means ≤ 2.000 were examined to determine their suitability for the LES. The frequency count means ranged from 1.176 to 5.019 and three events had means less than 2.000: event 60, *Job Requires Much Traveling*; event 61, *Car Problems*; and event 62, *Dealing With Financial Problems of Close-ones*. Oddly enough, while all three occurred least frequently, they had the highest three extent means. Based on previous discussion of Section I events, it was determined event 60 was redundant to event 1 and could be dropped from Section II. Because of the high extent means of events 61 and 62 and the small sample size, both shall remain in Section II unless subsequent research indicates otherwise.

The range of extent means from Table 20 is from 3.240 to 4.136. These means are considerably lower than those found for Section I events. It was expected that because of the recency of minor life events (within two weeks), respondents would report them as being more stressful experiences. The reason this did not occur might be explained by the fact that respondents develop improved coping techniques and, therefore, experience less stress with an increased frequency of event occurrence.

The Pearson r correlation coefficients for the extents of Section II events are shown in Table 23, Appendix J. All events except 60, *Job Requires Much Traveling*, and

event 66, *Change in Daily Routine*, are significantly correlated with at least two other events. The absence of correlations for event 60 provides additional support for removing it from Section II. The absence of correlations for event 66, however, is insufficient evidence to warrant removal because it still possesses a relatively high frequency count (3.409) and extent mean (3.458). For these reasons, it should remain in the LES until subsequent research indicates otherwise.

All significant correlations from Table 23 were in the positive direction and coefficients ranged from .34 to .69. Only one pair of events with significant correlations seemed to possess a logical relationship to one another: event 65, *Driving in Rush Hour Traffic*, and event 61, *Car Problems*. From Table 23, it appears that the stress caused by eight of the ten minor events exacerbate one another, and in general, the events appear to capture the minor life events concept.

Frequency Analysis and Pearson Correlations for Continuous Life Events

Fifteen life events were included in Section III. The frequencies of the percent of event occurrence and positive versus negative assessment of those events are summarized in Table 18, Appendix I. From Table 18, the results indicate each event occurred to at least 16 respondents, with a range of "percentage of occurrence" from 18 percent

to 78 percent. Table 18 also shows that respondents made distinctions between the positiveness and negativeness of all events in this section.

The means and standard deviations for the extents of stress caused are shown in Table 21, Appendix I. It was uncertain as to how respondents would rate the extents for continuous events. Following the logic expressed for Section II events, it might be expected that because continuous events were basically occurring constantly, the coping techniques used by respondents would be developed to an extent where the events caused very little stress. This, however, was not the case. Extent means ranged from 3.529 to 4.857 and averaged .612 higher than the average mean for Section II events. This unexpected result could possibly be explained by the fact that because the events occurred continuously, respondents found themselves in what Seyle had called the stage of exhaustion (refer to Figure 1) and perceived the event as being more stressful regardless of coping capabilities.

The Pearson r correlation coefficients for the extents of Section III events are shown in Table 24, Appendix J. All events except 83, *Pressures of Attending School*, are significantly correlated with at least one other event. Because event 83 had a percent of occurrence of 29 percent and a high extent mean of 4.556, it will remain in the LES until subsequent research indicates otherwise.

All significant correlations from Table 24 were in the positive direction (except event 76 with event 80) and coefficients ranged from .33 to 1.00. Event 76, *Continuous Church Responsibilities*, is negatively correlated with event 80, *Eating or Drinking Too Much*, with a coefficient of -1.00. Such a correlation is a logical association in that stress over eating and drinking too much should be less as the stress of continuous church responsibilities increased. From the extent of correlations shown in Table 24, it appears 14 of the 15 events exacerbate one another, and, in general, the events seem to capture the continuous life events concept.

Frequency Analysis of Additional Life Events

The final page of the LES was titled Additional Life Events and requested respondents list the major, minor, and continuous life events, which they believed were not covered by the LES (refer to Appendix H). Respondents were also asked to indicate the frequency of occurrence of listed events and provide an assessment of each event's positiveness or negativeness. Additional events were identified by 31 of 152 respondents; however, most events listed were merely specific examples of events already covered by the LES. Once these specific events were eliminated, only 10 completed surveys identified "additional" events. These events, their frequency, their positive versus negative assessment, and the

number of respondents who identified them are summarized in Table 6.

Table 6

Frequency Analysis of Additional Life Events

Events	Frequency	Pos/Neg	No. Identifying
Worry About Economy	Continuous	N	1
Stopped a Habit	1	N	1
Watch/Read News	14	N	1
Income Tax Preparation	3	P	1
Suicide	1	N	1
Listening to Problems of Close-ones	Continuous	N	2
Establishing Part-Time Career	1	P	1
Problems of Homosexuality	Continuous	N	1
Problems with Neighbors	Daily	N	2
Competitions	8	P	2

The 10 additional events identified fall into all three LES section categories based on frequency counts, and positive versus negative distinctions are apparent. While the number of respondents identifying these events is small, future researchers may want to add these events to a revised LES.

Summary and Conclusions

The purpose of this research was to develop a life events research instrument that would identify events stressful to DOD employees. The instrument would also provide individual data on the frequency of life event occurrence, assessment of event positiveness or negativeness, and measurement of the extenc to which events caused individuals personal stress. In this section, each research question will be individually answered in an initial determination of the potential utility of the LES in stress research. Following these answers, the conclusions, based on the results of this research, will be outlined.

> Research Question 1a: What major life events, unique to DOD employees, are identified most as potential causers of stress?

Analysis of survey results indicate that each of the 58 life events identified in Section I of the LES had occurred to at least one of the respondents. Eleven events, however, occurred to 50 percent or more of the sample. These events and the percentage of respondents who reported them as occurring are summarized in Table 7. Four of the events involve a change in the job environment of the DOD employee. This would be expected considering the mobility of military and, to a lesser extent, government civilian personnel. Two other events, while job related, involve personal relationships with supervisors and inspections or evaluations of an individual's job. Three events involve the family, one with

respect to vacation and holiday activities and the other with respect to separations related to job requirements. The remaining two events both involve the individual's economic situation.

Table 7

Major Life Events Occurring to ≥ 50 Percent of the Sample

Event	% Occurrence
38. Vacation	81
22. Change of Job Supervisor	73
51. Activities Associated with Holidays	69
20. Change in Job Responsibility	66
19. Changing Jobs	65
34. Change in Income	60
1. Family Separation	58
25. Experience Job Inspection/Evaluation	58
26. Confrontation With Supervisor	54
21. Change of Job Position	53
32. Making Other Large Financial Investments	52

Research Question 1b: What minor life events, unique to DOD employees, are identified most as potential causers of stress?

Analysis of survey results indicate that each of the 10 life events identified in Section II of the LES had occurred to at least 17 of the respondents. Four of the events, however, occurred to at least half of the sample all of the time. These events and the percentage of respondents who reported them as occurring are summarized in Table 8. *Driving in*

Rush Hour Traffic was the minor life event occurring to most respondents. The remaining three events involved the job environment and the maintenance of individuals' homes and cars.

Table 8

Minor Life Events Occurring to ≥ 50 Percent of the Sample

Event	% Occurrence
65. Driving in Rush Hour Traffic	58
59. Briefing Superiors	57
63. Home Maintenance	57
61. Car Problems	52

Research Question 1c: What continuous life events, unique to DOD employees, are identified most as potential causers of stress?

Analysis of survey results indicate that each of the 15 life events identified in Section III of the LES had occurred to at least 16 of the respondents. Five of the events, however, occurred to at least half of the sample. These events and the percentage of respondents who reported them as occurring are summarized in Table 9. The event reported most often was *Maintaining Physical Appearance/Self-Image* followed closely by *Job Responsibility and Pressures*. The remaining events involve the individuals' personal life, specifically, marriage, parenting, and maintaining one's lifestyle.

Table 9

Continuous Life Events Occurring to
≥ 50 Percent of the Sample

Event	% Occurrence
81. Maintaining Physical Appearance/ Self-Image	78
73. Job Responsibility and Pressures	73
71. Responsibility of Marriage	63
69. Responsibility of Being a Parent	59
82. Maintaining Lifestyle	55

Research Question 2a: What major life events are most stressful to DOD employees?

Table 10 shows the major life events with mean values ≥ 5 . A 5 on the LES indicated the event caused a fairly large extent of stress in individuals. Eleven events had mean values greater than 5 and the most stressful event was *Change in Marital Relationship*. It's interesting to note that four of the five most stressful events involve the husband and wife relationship. It's also interesting that *Death of A Close-one* was the sixth most stressful event listed. All other life event scales have shown death (usually death of a spouse) to be the most stressful event. The remaining events involve retirement, relationships with supervisor and close-ones, acute medical problems, and close-ones being victims of crime. Conspicuously absent from this list are events involving the work environment.

Table 10

Most Stressful Major Life Events ($\bar{x} \geq 5$)

Event	% Occurrence
11. Change in Marital Relationship	6.267
12. Getting Divorced	5.929
23. Retirement	5.667
17. Spouse is Unfaithful	5.600
14. Marital Relationship	5.563
44. Death of A Close-one	5.414
46. Acute Medical Problem of A Close-one	5.205
42. Change in Relationship With a Close-one	5.161
26. Confrontation With Supervisor	5.120
45. Acute Personal Medical Problem	5.056
15. Marital Reconciliation	5.000
49. Close-one Is A Victim of A Crime	5.000

Research Question 2b: What minor life events are most stressful to DOD employees?

The five most stressful minor life events are listed in Table 11. What is interesting about these minor events is the fact that their means indicate only little or moderate extents of stress caused.

Research Question 2c: What continuous life events are most stressful to DOD employees?

The five most stressful continuous life events are listed in Table 12. These events were also found to have relatively low extent means, ranging between moderately stressful and stressful to a fairly large extent.

Table 11

Five Most Stressful Minor Life Events

Event	$\bar{x}$
62. Dealing With Financial Problems of Close-ones	4.136
61. Car Problems	4.042
60. Job Requires Much Travelling	3.722
68. Misplacing or Losing Things	3.619
63. Home Maintenance	3.596

Table 12

Five Most Stressful Continuous Life Events

Event	$\bar{x}$
79. Chronic Medical Problem of a Close-one	4.857
69. Responsibility of Being a Parent	4.727
83. Pressures of Attending School/Training	4.556
72. Uncomfortable Job Environment	4.513
70. Family Bickering	4.472

Research Question 3a: What major life events are most significantly correlated?

Table 22, Appendix J, provides a detailed Pearson r correlation coefficient matrix, and this matrix is summarized by event earlier in this chapter. The five most significant correlations at each significance level are listed in

Table 13. Table 13 indicates the correlations were extremely strong and involved the life areas of home, job, family, personal relationships, finances, socializing, and education.

Table 13

Highest Five Pearson r Correlations for Major Life Events at Each Significance Level

Significance	Event Relationship*	Pearson r Coefficient
$p < .05$	28 with 35	.97
	7 with 9	.97
	3 with 53	.94
	49 with 54	-.93
	16 with 31	.91
	13 with 54	.91
	3 with 34	.91
$p < .01$	16 with 57	.97
	24 with 56	.96
	8 with 52	.95
	47 with 57	.94
	25 with 48	.89
$p < .001$	9 with 21	.99
	56 with 57	.85
	40 with 50	.77
	21 with 22	.70
	53 with 56	.67

*Refer to Appendix H for cross-reference with event names.

Research Question 3b: What <u>minor</u> life events are most significantly correlated?

Table 23, Appendix J, provides a detailed Pearson r correlation coefficient matrix, which was summarixed earlier in this chapter. Table 14 lists the five most significant

correlations between minor life events.

Table 14

Highest Five Pearson r Correlations for Minor Life Events

Significance	Event Relationship	Pearson r Coefficient
$p < .01$	63 with 64	.69
	63 with 68	.49
	61 with 68	.49
$p < .05$	64 with 67	.69
	62 with 65	.65

Research Question 3c: What continuous life events are most significantly correlated?

Table 24, Appendix J, provides a detailed Pearson r correlation coefficient matrix, which was summarized earlier in this chapter. The five most significant correlations at each significance level are listed in Table 15.

Table 15

Highest Five Pearson r Correlations for Continuous Life Events at Each Significance Level

Significance	Event Relationship	Pearson r Coefficient
$p < .001$	76 with 77	.97
	72 with 74	.86
	71 with 82	.70
	69 with 71	.65
	72 with 73	.60

Table 15 (Continued)

Significance	Event Relationship	Pearson r Coefficient
$p < .01$	75 with 77	.82
	76 with 82	.70
	79 with 80	.69
	71 with 76	.66
	70 with 71	.56
$p < .05$	76 with 78	.84
	75 with 76	.77
	69 with 77	.56
	70 with 79	.54
	75 with 82	.54

The LES has been shown to capture those life events which cause stress in DOD employees. Virtually every event in all three categories--major, minor, and continuous--showed some frequency of occurrence within this sample. More importantly, numerous and significant correlations occurred between life events involving the family, marriage, occupation, economics, religion, recreation, residence, group and peer relationships, health, socializing, and education. While most frequent correlations seemed to involve family, residence, occupation, and marriage, clearly stress caused by events in each of the areas appears to exacerbate the stress caused by events in all other areas. Based on these findings, the LES has potential significant utility in subsequent stress research. The recommendations for future research in Chapter 5 will outline how this utility can be realized.

AD-A123 131 DEVELOPMENT OF THE LIFE EVENTS SURVEY AS A MEASURING INSTRUMENT FOR STRESS RESEARCH(U) AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYST.. 2/2

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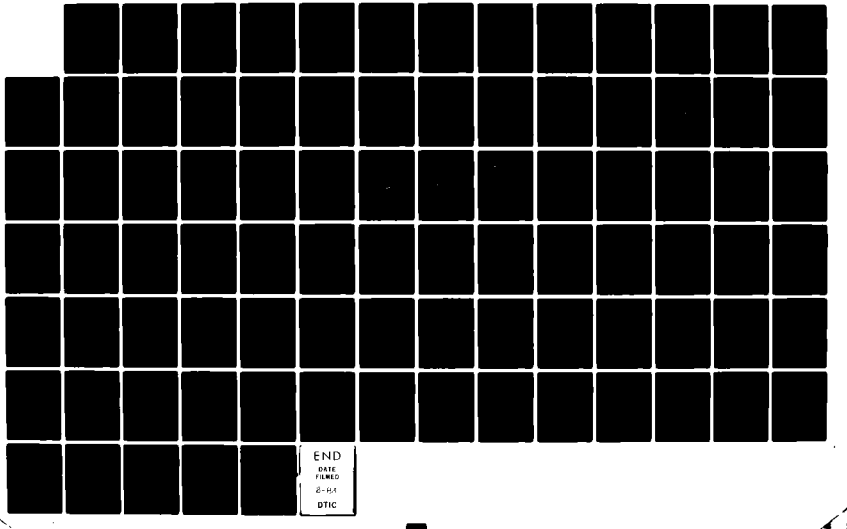
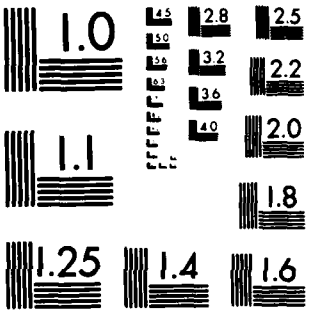




CHAPTER 5

RECOMMENDATIONS FOR FUTURE RESEARCH

Life event studies have shown significant and positive correlation between life event stressor magnitudes and some physiological parameters associated with coronary heart disease (48; 51). This association can be explained as follows (9:1-3): an increase in stress causes increased levels of cholesterol in the blood. This cholesterol accumulates in the arterial wall, eventually restricts the flow of blood, and increases the risk of blood clots--the major cause of heart attacks (11:351; 21:15,16).

Three additional physiological parameters associated with coronary heart disease are affected by increases in stress: cortisol, HDL cholesterol, and the ratio of cholesterol to HDL cholesterol. First, blood cortisol levels have been shown to increase as acute stress is experienced (2:956; 23:49; 43:815), and decrease as chronic stress is experienced (3:181). The importance of cortisol to this research is based on the evidence that cortisol production is inversely related to cholesterol production (51). Second, HDL cholesterol appears to be inversely related to coronary heart disease and actually decreases the risk of disease by transporting cholesterol from the arterial wall cells to the liver for excretion (9:3; 24). Finally, the ratio of

cholesterol to HDL cholesterol has been shown to be positively related to an increased risk of coronary heart disease (9:3; 51).

If it can be accepted that a causal relationship exists between life event stressors and the onset of coronary heart disease, then it would seem logical to see if the LES, as part of a broader methodology, is a significant predictor of coronary heart disease. As was described in Chapter III, the LES was, in fact, developed as a part of a broader research effort. The thrust of that effort was to examine the relationships of job and personal factors to the physiological components of coronary heart disease and perceived stress. The job and personal factors and perceived stress were measured by the Stress Assessment Package (Version 2), and the physiological components were obtained through blood analysis. Through further analysis of these factors, components, and the data available from the LES, the following research questions could be posed and answered:

1. What are the major, minor, and continuous life events that are significantly correlated with perceived stress?

2. What are the major, minor, and continuous life events that are significantly correlated with cholesterol, HDL cholesterol, cortisol, and the ratio of total cholesterol to HDL cholesterol?

3. What are the major, minor, and continuous life events that are significantly correlated with specific job and personal factors as measured by the SAP?

More specifically, the primary job and personal factors that have been identified for such analysis include: locus of control, Type A/B behavior, job productivity, job autonomy, intergroup conflict, task significance, goal clarity, need for enrichment, job enhancement, supervisory control, general organizational climate, co-worker relations, assertiveness, family relations, exercise, job satisfaction, tolerance for change, and dietary fat. In total, 25 factors resulted from factor analysis of data collected from versions 1 and 2 of the SAP.

If the correlations are found to be significant, then multiple regression analysis should be conducted for answering the following additional research questions:

4. What major, minor, and continuous life events are predictive of perceived stress?

5. What major, minor, and continuous life events are predictive of cholesterol, HDL cholesterol, cortisol, and the ratio of total cholesterol to HDL cholesterol?

If multiple regression analysis provides evidence that life events are good predictors of perceived stress and any of the four physiological components of coronary heart disease, then additional regressions should be performed. These regressions could be used to determine the mediating

affects the job and personal factors have on the predictive capabilities of life events. Additional research questions in this regard might be:

6. What job and personal factors act as mediating variables in the predictive relationship between major, minor, and continuous life events and perceived stress?

7. What job and personal factors act as mediating variables in the predictive relationship between major, minor, and continuous life events and the physiological components of coronary heart disease?

8. What are the specific relationships between mediating variables and those life events that are good predictors of either perceived stress or the physiological components of coronary heart disease.

The LES also collected individual frequency counts and positive versus negative assessments of each life event. This informaton permits the calculation of a variety of different total life event scores. The first, as was described in the literature review, merely sums the frequency of each event to obtain a total life event score or simple frequency count. A second score could be obtained by multiplying event frequency counts by the individually perceived extent of stress caused by that event. These products could then be summed to obtain a multiplicative life event score. Finally, the positive versus negative assessments could be used to produce a positive simple

frequency count (the sum of frequencies for only positive events), a negative simple frequency count, a positive multiplicative life event score (the summation of the product of positive event frequencies and their extents), and a negative multiplicative life event score. It could be hypothesized that multiplicative scores would be better predictors of perceived stress and the physiological components of coronary heart disease because these scores incorporate many individual peculiarities inherent in that person's extent response. Potential research questions in this area could be:

9. What life event scores (all six could be tested) are predictive of perceived stress?

10. What life event scores are predictive of the physiological components of coronary heart disease?

11. Which scoring technique best predicts perceived stress and the physiological components of coronary heart disease?

12. Are life event scores better predictors when based on positive or negative assessments of life events? Is this distinction necessary for life events research?

A check on the overall utility of the LES as an instrument designed specifically for DOD employees should be accomplished. This can be done by selecting only those events common to both the LES and SRRS. TLCU scores are computed as well as scores derived from the best scoring

technique described above. A comparison is then made between the predictive capabilities of both techniques. It would be hypothesized that the latter technique would prove to be the better predictor.

Finally, the LES must be readministered in an effort to build a larger data base. With an n=400, factor analysis could be accomplished on the life event extents. Through multivariate techniques, predictive equations could be calculated.that would be generalizable across the DOD employee population. Also, it would be interesting to discover if minor or continuous life event factors possibly act as mediating variables to major life event factors. The possibilities for research in this area truly appear endless.

APPENDIX A

GLOSSARY OF TERMS

Illness Behavior - Varying thresholds which people have for regarding themselves as sick and for consulting a doctor.

Life Change Unit (LCU) Values - Numerical weights equal to the sample mean value for an event divided by 10 (18:216).

Life Events - Social stressors in the form of life events pertaining to our social structure: family, marriage, occupation, economics, religion, recreation, and health, which are indicative of individual life style or happen to an individual and subsequently requires adaptive or coping behavior by the individual (35:1014).

Mediating Factors - Characteristics of stressful events, individuals, and social support systems that influence perceptions of stress or sensitivity to stress.

Normative Sample - The sample group used in the original SRRS study (18:213-218). The result of that study was the SRRS or normative scale.

Onset of Illness - The appearance of clinical symptoms of disease as diagnosed by a physician, as opposed to simply a clinical visit (35:1014).

Periarticular Structures - Structures surrounding a joint.

Predisposing Factors - Long standing behavior patterns, childhood experiences and durable personal and social characteristics that may alter individual susceptibility to illness.

Precipitating Factors - Factors which influence the timing of illness onset.

Retrospective Contamination - The tendency of a patient to color the occurrence of previous life events to justify their present illness.

Schedule of Recent Events (SRE) - A paper and pencil test which results in the frequency of occurrence of 42 life events. Reference to the SRE in this research will include all similarly structured questionnaires, which differ only in the list of life events they contain.

Social Readjustment Rating Questionnaire (SRRQ) - A paper and pencil test which results in the SRRS. Reference to the SRRQ in this research will include all similarly structured questionnaires, which differ in the life events they contain and, in some cases, the numerical range of the rating scale developed.

Social Readjustment Rating Scale - The resultant quantitative ranking and scaling via life change units (LCUs) of 43 life events from administration of the SRRQ. Reference to the SRRS in this research will include

all similarly structured and derived scales, which differ in the life events they contain and, in some cases, the numerical range of the rating scales.

Stress - ". . . the organism's response to stressful conditions or stressors, consisting of a pattern of physiological and psychological reactions, both immediate and delayed [35:1014]."

Stressor Indicator Score - The numerical score, resulting from the SRE (frequency count) or the summation of LCUs. This score indicates the magnitude of stress an individual is experiencing.

Total Life Change Unit Values - The numerical score resulting from the summation of *LCUs*. All weighted scaling methods produce stress indicator scores. These scores are total life change unit values.

Type A Behavior Pattern - Coronary prone behavior style characterized by an intense hard driving competitiveness accompanied by a chronic sense of urgency.

Type B Behavior Pattern - A more relaxed lifestyle relatively free of the above characteristics.

APPENDIX B

SOCIAL READJUSTMENT RATING SCALE

RANK	LIFE EVENT	LCU VALUES
1	Death of a Spouse	100
2	Divorce	73
3	Marital Separation	65
4	Jail Term	63
5	Death of Close Family Member	63
6	Personal Injury or Illness	53
7	Marriage	50
8	Fired at Work	47
9	Marital Reconciliation	45
10	Retirement	45
11	Change In Health of Family Member	44
12	Pregnancy	40
13	Sex Difficulty	39
14	Gain of New Family Member	39
15	Business Readjustment	39
16	Change in Financial State	38
17	Death of Close Friend	37
18	Change to Different Line of Work	36
19	Change in Number of Arguments with Spouse	35
20	Mortgage over $10,000	31
21	Foreclosure of Mortgage or Loan	30
22	Change in Responsibilities at Work	29
23	Son or Daughter Leaving Home	29
24	Trouble with In-Laws	29
25	Outstanding Personal Achievement	28
26	Wife Begins or Stops Work	26
27	Begin or End School	26
28	Change in Living Conditions	25
29	Revision of Personal Habits	24
30	Trouble with Boss	23
31	Change in Work Hours or Conditions	20
32	Change in Residence	20
33	Change in Schools	20
34	Change in Recreation	19
35	Change in Church Activities	19
36	Change in Social Activities	18
37	Mortgage or Loan Less Than $10,000	17
38	Change in Sleeping Habits	16
39	Change in Number of Family Get-Togethers	15
40	Change in Eating Habits	15
41	Vacation	13
42	Christmas *	12
43	Minor Violations of the Law	11

* Life Event #42, Christmas, was not a part of the SRE

APPENDIX C

DISTRESS SYMPTOM CHECKLIST SCALE

RANK	EVENT	LCU MEAN
1	Death of a Child	19.33
2	Death of Spouse	18.76
3	Jail Sentence	17.60
4	Death of Close Family Member (Parent, Sibling)	17.21
5	Spouse Unfaithful	16.78
6	Major Financial Difficulties (Very Heavy Debts, Bankruptcy)	16.57
7	Business Failure	16.46
8	Fired	16.45
9	Miscarriage or Stillbirth	16.34
10	Divorce	16.18
11	Marital Separation Due to Argument	15.93
12	Court Appearance for Serious Legal Violation	15.79
13	Unwanted Pregnancy	15.57
14	Hospitalization of Family Member (Serious Illness)	15.30
15	Unemployed for One Month	15.26
16	Death of Close Friend	15.18
17	Demotion	15.05
18	Major Personal Physical Illness (Hospitalization or One Month Off Work)	14.61
19	Begin Extramarital Affair	14.09
20	Loss of Personally Valuable Object	14.07
21	Lawsuit	13.78
22	Academic Failure (Important Exam or Course)	13.52
23	Child Married Against Respondent's Wishes	13.24
24	Break Engagement	13.23
25	Increased Arguments with Spouse	13.02
26	Increased Arguments with Resident Family Member	12.83
27	Increased Arguments with Fiance or Steady Date	12.66
28	Take a Large Loan (More Than One-Half of a Year's Earnings)	12.64
29	Son Drafted	12.32
30	Arguments with Boss or Co-Worker	12.21
31	Argument with Nonresident Family Member (In-Laws, Relatives)	12.11
32	Move to Another Country	11.37
33	Menopause	11.02
34	Moderate Financial Difficulties (Bothersome But Not Serious, ie, Increased Expenses, Trouble from Bill Collectors)	10.96
35	Separation from Significant Person (Close Friend or Relative)	10.68
36	Take Important Exam	10.44
37	Marital Separation Not Due to Argument	10.33
38	Change in Work Hours (Much Overtime, Second Job, Much Less Than Usual)	9.96
39	New Person in Household	9.71
40	Retirement	9.33
41	Change in Work Conditions (New Department, New Boss, Big Reorganization)	9.23
42	Change in Line of Work	8.84
43	Cease Steady Dating (Of at Least Three Months)	8.80

44	Move to Another City	8.52
45	Change in Schools	8.15
46	Cease Full-Time Education (Graduate or Drop Out)	7.65
47	Child Leaves Home (eg, College)	7.20
48	Marital Reconciliation (*After One Partner Left Home*)	6.95
49	Minor Legal Violation	6.05
50	Birth of Live Child (for Mother)	5.91
51	Wife Becomes Pregnant	5.67
52	Marriage	5.61
53	Promotion	5.39
54	Minor Personal Physical Illness (One That Requires Physician's Attention)	5.20
55	Move in Same City	5.14
56	Birth of a Child (Father) or Adoption	5.13
57	Begin Education (Full Time or Half-Time)	5.09
58	Child Becomes Engaged	4.53
59	Become Engaged	3.70
60	Wanted Pregnancy	3.56
61	Child Married with Respondent's Approval	2.94

APPENDIX D

LAZARUS' LISTING OF HASSLES AND UPLIFTS

HASSLES	UPLIFTS
1. Concern about Weight	1. Relating well with your Spouse or Lover
2. Health of a Family Member	2. Relating well with Friends
3. Rising Prices of Common Goods	3. Completing a Task
4. Home Maintenance	4. Feeling Healthy
5. Too Many Things to Do	5. Getting Enough Sleep
6. Misplacing or Losing Things	6. Eating Out
7. Yard Work or Outside Home Maintenance	7. Meeting Responsibilities
8. Property, Investments, or Taxes	8. Visiting, Phoning, or Writing Someone
9. Crime	9. Spending Time with Family
10. Physical Appearance	10. Home Pleasing to You

APPENDIX E

RANK ORDER LISTING OF STRESSFUL LIFE EVENTS BY FREQUENCY OF IDENTIFICATION AND CATEGORY

A. FAMILY

Life Event	Frequency
1. Parenting, the Responsibility of Being a Mother/ Father to Your Children	8
2. Separation from Family Because of a Move Related to Your Job	7
3. Children are having Problems in School	5
4. Birth of a Child	4
5. Child Adoption	1
6. Additional Child Cared for by Family for Some Period	1
7. Debut of Daughter	1
8. Separation from Children because of Divorce	1
9. Family Bickering	1
10. Offspring Lost Job	1
11. Husband Participates in Wife's Political Campaign	1
12. Offspring Involved in Fight	1
13. Offspring Left Home	1
14. Not Enough Time to be Parent Because of Job	1
15. In-Laws Moved	1
16. Pregnancy, False Alarm	1

B. MARRIAGE

Life Event	Frequency
1. Marital Problems	9
2. Divorce	8
3. Marriage	6
4. Marriage of Offspring	4
5. Marital Separation	2
6. Divorce of Parents/Relatives	2
7. Meeting New In-Laws	2

C. OCCUPATION

Life Event	Frequency
1. Changing Jobs/Starting New Job	25

2.	Working in an Uncomfortable Job Environment Because of Unreasonable Supervisor/Bad Job Situation/Lack of Space/ Loss of Authority/Commander Inaction/Understaffing	16
3.	Job Responsibilities (Commander/Trainer/Supervisor/ Priority Work)	11
4.	Promotions (Rank, Position, Waiting)	8
5.	Change of Supervisors/Top Management	6
6.	Retirement	5
7.	Looking for Work	5
8.	Changed Careers	4
9.	Notification of Job Deletion	4
10.	Briefing Superiors/High Ranking Officials	4
11.	Government Study of Job	3
12.	Confrontation with Supervisor	2
13.	Involved in Work Grievance (EEO)	2
14.	Nonpromotion	2
15.	Job Interruption from Computer Implementation	2
16.	Underwent Inspection	2
17.	Going on Job Interviews	2
18.	Organization Budget Cuts	1
19.	Job Requires Work/Travel Alone	1
20.	Received Bad Inspection Report	1

D. ECONOMICS

Life Event		Frequency
1.	Buying a House	13
2.	Continuing Financial Problems (Actual/Concern)	8
3.	Buying a Car	3
4.	Car Problems	3
5.	Income Taxes (Too High, Difficulties)	3
6.	Selling a House	3
7.	Investment Decision	2
8.	In-Laws Experiencing Financial Problems	1
9.	Financial (Investment) Loss	1
10.	Failure to Get Paid	1

E. RELIGION

Life Event	Frequency
1. Break in Commitment to Church Work	1
2. Replaced as Manager of Church Credit Union	1
3. Conflict in Church	1

F. RECREATION

Life Event	Frequency
1. Watching Sports Events	2
2. Repeated Participation in Horse Shows	1
3. Extended Vacation	1
4. Air Travel for Vacation	1

G. RESIDENCE

Life Event	Frequency
1. Requirement to Move (CONUS/Overseas)	15
2. Unfinished Home Projects	1
3. Decision to Landscape Home	1
4. House Damage	1
5. Having to Live Offbase Overseas	1

H. GROUP AND PEER RELATIONSHIPS

Life Event	Frequency
1. Organization Conflicts	5
2. Goal Accomplishment Hindered Lack of Cooperation	4
3. Breakup of Personal Relationships	2
4. Problems with Personal Relationships	2
5. Having to Supervise Peers	1
6. Having to Counsel Nonproducing Employees	1

I. HEALTH

Life Event	Frequency
1. Medical Problem with Relative (Acute/Chronic)	30

2.	Death of a Relative or Loved One	20
3.	Personal Injury/Illness/Trauma (Acute/Chronic)	18
4.	Death of a Parent	10

J. SOCIALIZING

Life Event		Frequency
1.	Member of Committee	4
2.	Victim of a Crime	3
3.	Concern over Aging	2
4.	Eating/Drinking Too Much	1
5.	Weight Gain, Loss of Self-Image	1
6.	Driving in Heavy Traffic (Rush Hour)	1
7.	Change in Daily Routine	1
8.	Maintaining Life Style	1
9.	Dining with High Officials	1
10.	Lost in Big City	1
11.	Deciding on Where to Spend Leave	1

K. EDUCATION

Life Event		Frequency
1.	Going to School (UG, PG)	9
2.	Specialized Training (Technical School)	2
3.	OTS	1
4.	PME	1
5.	Offspring Leaving for College	1
6.	Offspring Graduating From College	1

Total Number of Life Events = 92

APPENDIX F

ORIGINAL LIFE EVENTS SURVEY

GENERAL INFORMATION AND INSTRUCTIONS

1. The Life Events Survey (LES) is a tool designed to identify the events in your life that you find stressful and determine the extent of personal stress resulting from these events.

2. Using the answer sheet provided, please mark your responses with a number 2 pencil only. Make heavy black marks that completely fill the appropriate space.

3. It is important that you answer all items honestly. This is the only way an accurate evaluation can be made of life events and the stress they cause.

4. Your individual response will be held in the strictest confidence, and will not be provided to any organization or persons. Only personnel directly involved in this research will have access to your completed LES.

5. In the information block in the upper right-hand corner of your answer sheet is an identification number. This number is wrong; please cross it out. Above it write the same number found on the answer sheet you used to complete the Stress Assessment Package and blacken the corresponding spaces.

EXAMPLE:

~~1984~~ 165

[0]	■	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[0]	[1]	[2]	[3]	[4]	[5]	■	[7]	[8]	[9]
[0]	[1]	[2]	[3]	[4]	■	[6]	[7]	[8]	[9]
[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]

SPECIFIC INSTRUCTIONS

1. The LES lists eighty-three (83) life events, which are believed to cause personal stress. These events are divided into three sections: major life events, minor life events, and continuous life events. Please read each life event and respond according to the following instructions:

a. Determine whether you have experienced the life event during the time period specified at the beginning of each section. For each event you did experience, determine the number of times it occurred during the specified period, place this number in the blank provided in the survey booklet, and refer to instruction b below. For each event you did not experience, place a zero (0) in the blank provided and refer to instruction c below.

b. Determine whether the life event was a positive or negative experience for you. For positive experiences, blacken the space D on your answer sheet. For negative experiences, blacken the space NA . If the life event occurred more than once, and it was positive sometimes and negative others, blacken the response which occurred more frequently. If there is a tie between the number of positive and negative experiences,

blacken the response you believe was more stressful. EXPLANATION: Each life event could be considered a positive or a negative experience depending on the circumstances surrounding it. For example, DEATH OF A CLOSE-ONE might be considered a sad and painful negative experience, while occurrence of a desirable PROMOTION might be considered a positive experience. To a different person, however, a PROMOTION, which increases their responsibility and work hours, might also be considered a negative experience. Please keep this distinction in mind when responding.

c. Determine the extent to which the life event caused you personal stress. If the event did not happen to you, determine the extent to which you believe the event would have caused you personal stress. Personal stress is defined here as <u>your</u> physical and emotional responses, both immediate and delayed, to the conditions surrounding a life event. The extent of stress is measured by the following seven (7) point scale:

1 = TO NO SIGNIFICANT EXTENT
2 = TO A VERY LITTLE EXTENT
3 = TO A LITTLE EXTENT
4 = TO A MODERATE EXTENT
5 = TO A FAIRLY LARGE EXTENT
6 = TO A LARGE EXTENT
7 = TO A VERY SIGNIFICANT EXTENT

Blacken the space on your answer sheet which best describes the extent to which the event caused or would have caused you personal stress. If the event occurred more than once during the specified period, your response should indicate the average extent to which <u>all</u> the occurrences caused you personal stress. EXPLANATION: The life events are worded in a general manner to keep the overall list short, and this wording is not meant to exclude life events of a highly specific nature. For example, DAUGHTER-IN-LAW EXPERIENCING AN INJURY is not specifically on the survey, but it can be scored under the general life event of ACUTE MEDICAL PROBLEM OF A CLOSE-ONE. In other words, many specific events may be included within the more general life event category. Space is provided at the end of the survey booklet for you to list any life events you believe were not covered by the survey. Additionally, each of us respond to life events to different extents because of differences in our personalities, our abilities to cope, and our experience with handling a particular life event. For example, a person who easily becomes stressful, who is unwilling to let supportive close-ones help them cope, and who has no experience with major life events might easily score 5, 6, and 7 on many of the events. Before starting the LES, evaluate yourself with respect to personality, coping ability, and experience, so that your responses actually reflect <u>your</u> personal stress.

2. The following example shows you how to complete (according to the instructions described above) one item from the LES:

a. In the survey booklet you read life event 9, GETTING MARRIED, and determine it happened to you twice in the period specified. Your response <u>in the booklet</u> might be as follows:

<u>2</u> 9. GETTING MARRIED

b. Next, you determine that GETTING MARRIED was a positive experience the first time and a negative experience the second time. If you considered the negative experience to be more stressful, your response on the answer sheet would be as follows:

[D] ■■■ 009 [1] [2] [3] [4] [5] [6] [7]

c. Finally, you determine that the extent of stress caused by GETTING MARRIED the first time was a 3 and the second time was a 6 . The average of both occurrences is a 4.5, which you may round off to 5 . Your response on the answer sheet would be as follows:

[D] ■■■ 009 [1] [2] [3] [4] ■■■ [6] [7]

DO NOT STAPLE OR OTHERWISE DAMAGE THE ANSWER SHEET

SECTION I

This section of the LES lists distinct major life events. These life events should be considered with respect to the last two (2) years or so. Follow the instructions already given.

D = POSITIVE
NA = NEGATIVE
1 = TO NO SIGNIFICANT EXTENT
2 = TO A VERY LITTLE EXTENT
3 = TO A LITTLE EXTENT
4 = TO A MODERATE EXTENT
5 = TO A FAIRLY LARGE EXTENT
6 = TO A LARGE EXTENT
7 = TO A VERY SIGNIFICANT EXTENT

___ 1. Family Separation (Other than Marital Separation)

___ 2. Change in Number of Family Get-Togethers

___ 3. Birth of a Child

___ 4. Adoption of a Child

___ 5. Addition of a Non-immediate Family Dependent to Home

___ 6. Offspring Leaves Home

___ 7. Pregnancy

___ 8. Loss Experienced When Close-One Moves Away

___ 9. Getting Married

___ 10. Marriage of a Close-One

___ 11. Change in Marital Relationship

___ 12. Getting Divorced

___ 13. Divorce of a Close-One

___ 14. Marital Separation

___ 15. Marital Reconciliation

___ 16. Sex Difficulty

___ 17. Spouse is Unfaithful

___ 18. Extramarital Affair

___ 19. Changing Jobs

___ 20. Change in Job Responsibility

___ 21. Change of Job Position (Promotion/Demotion)

D = POSITIVE
NA = NEGATIVE
1 = TO NO SIGNIFICANT EXTENT
2 = TO A VERY LITTLE EXTENT
3 = TO A LITTLE EXTENT
4 = TO A MODERATE EXTENT
5 = TO A FAIRLY LARGE EXTENT
6 = TO A LARGE EXTENT
7 = TO A VERY SIGNIFICANT EXTENT

___ 22. Change of Job Supervisor

___ 23. Retirement

___ 24. Change Careers

___ 25. Experience Job Inspection/Evaluation

___ 26. Confrontation With Supervisor

___ 27. Confrontation With Co-Workers

___ 28. Change of Employment Status

___ 29. Change in Employment Status of Spouse

___ 30. Buying a House

___ 31. Selling a House

___ 32. Making Other Large Financial Investments

___ 33. Experience a Financial Difficulty

___ 34. Change in Income

___ 35. Experience a Tax Problem

___ 36. Change in Commitment to Church

___ 37. Change in Religious Beliefs

___ 38. Vacation

___ 39. Change in Recreation Routine

___ 40. Required to Move

___ 41. Change in Relationship With a Close-One

___ 42. House Damaged

___ 43. Counseling Employees

___ 44. Death of a Close-One

___ 45. Acute Personal Medical Problem

___ 46. Acute Medical Problem of A Close-One

D = POSITIVE
NA = NEGATIVE
1 = TO NO SIGNIFICANT EXTENT
2 = TO A VERY LITTLE EXTENT
3 = TO A LITTLE EXTENT
4 = TO A MODERATE EXTENT
5 = TO A FAIRLY LARGE EXTENT
6 = TO A LARGE EXTENT
7 = TO A VERY SIGNIFICANT EXTENT

___ 47. Change in Social Participation (Join a Committee)

___ 48. Victim of a Crime

___ 49. Close-one is a Victim of a Crime

___ 50. Socializing with High Officials

___ 51. Activities Associated With Holidays

___ 52. Legal Problems

___ 53. Outstanding Personal Achievement

___ 54. Starting School/Training

___ 55. Graduating from School/Training

___ 56. Close-one is Starting School/Training

___ 57. Close-one is Graduating from School/Training

___ 58. Academic Efforts (Exam/Paper)

SECTION II

This section of the LES lists distinct minor life events. These life events should be considered with respect to the last two (2) weeks or so. Follow the instructions already given.

___ 59. Briefing Superiors

___ 60. Job Requires Much Travelling

___ 61. Car Problems

___ 62. Dealing with Financial Problems of Close-one

___ 63. Home Maintenance

___ 64. Supervising Peers

___ 65. Driving in Rush Hour Traffic

___ 66. Change in Daily Routine

___ 67. Frequent Social Obligations

D = POSITIVE
NA = NEGATIVE
1 = TO NO SIGNIFICANT EXTENT
2 = TO A VERY LITTLE EXTENT
3 = TO A LITTLE EXTENT
4 = TO A MODERATE EXTENT
5 = TO A FAIRLY LARGE EXTENT
6 = TO A LARGE EXTENT
7 = TO A VERY SIGNIFICANT EXTENT

___ 68. Misplacing or Losing Things

SECTION III

This section of the LES lists minor and major life events, which can cause stress on a continuous basis. These life events should be considered with respect to your present situation. Follow the instructions already given, except instead of providing the number of occurrences, place a 1 or 2 in the blank provided to indicate:

1 = Event is occurring in your life at this time
2 = Event is not occurring in your life at this time

___ 69. Responsibility of Being a Parent

___ 70. Family Bickering

___ 71. Responsibility of Marriage

___ 72. Uncomfortable Job Environment

___ 73. Job Responsibility and Pressures

___ 74. Inability to Accomplish Job

___ 75. Continuous Financial Problems

___ 76. Continuous Church Responsibilities

___ 77. Frequent Recreation Routine (Daily Workout)

___ 78. Chronic Personal Medical Problem

___ 79. Chronic Medical Problem of Close-one

___ 80. Eating or Drinking too Much

___ 81. Maintaining Physical Appearance/Self Image

___ 82. Maintaining Life Style

___ 83. Pressures of Attending School/Training

ADDITIONAL LIFE EVENTS

In the blanks provided on the following page, list the major, minor, and continuous life events, which you believe were not covered by the LES.

Please indicate the frequency of occurrence, and whether it was a positive (1) or negative (2) experience in the spaces provided.

Example:

Purchase a Pet	5	1
LIFE EVENT	**FREQUENCY**	**POS/NEG**

APPENDIX G

REVISED LIFE EVENT SURVEY INSTRUCTIONS

GENERAL INFORMATION AND INSTRUCTIONS

1. The Life Events Survey (LES) is a tool designed to identify the events in your life that you find stressful and determine the extent of personal stress resulting from these events.

2. Using the answer sheet provided, please mark your responses with a number 2 pencil only. Make heavy black marks that completely fill the appropriate space. Do not staple or otherwise damage the answer sheet.

3. It is important that you answer all items honestly. This is the only way an accurate evaluation can be made of life events and the stress they cause.

4. Your individual response will be held in the strictest confidence, and will not be provided to any organization or persons. Only personnel directly involved in this research will have access to your completed LES.

5. In the information block in the upper right-hand corner of your answer sheet is an identification number. This number is wrong, please cross it out. Above it write the same number found on the answer sheet you used to complete the Stress Assessment Package and blacken the corresponding spaces.

EXAMPLE:

~~1985~~ 165

[0] ■ [2] [3] [4] [5] [6] [7] [8] [9]
[0] [1] [2] [3] [4] [5] ■ [7] [8] [9]
[0] [1] [2] [3] [4] ■ [6] [7] [8] [9]
[0] [1] [2] [3] [4] [5] [6] [7] [8] [9]
[0] [1] [2] [3] [4] [5] [6] [7] [8] [9]

6. The LES lists eighty-three (83) life events, which are believed to cause personal stress. The life events are worded in a general manner to keep the overall list short, and this wording is not meant to exclude life events of a highly specific nature. For example: DAUGHTER-IN-LAW EXPERIENCING AN INJURY is not specifically on the survey, but it can be scored under the general life event of ACUTE MEDICAL PROBLEM OF A CLOSE ONE. In other words, many specific events may be included within the more general life event category. Space is provided at the end of the survey booklet for you to list any life events you believe were not covered by the survey.

7. The life events are divided into three sections; major life events, minor life events, and continuous life events. Please respond according to the following instructions for each life event:

a. First, read the life event and determine whether you have experienced it during the time period specified at the beginning of each section. For each event you did experience, determine the number of times it occurred during the specified period and place this number in the FREQUENCY blank provided in the survey booklet. For each event you did

not experience, place a zero (0) in the blank provided.

EXAMPLE: In the survey booklet you read life event 19, CHANGING JOBS, and determine it happened to you twice in the period specified. Your response in the booklet would be as follows:

2 19. CHANGING JOBS

b. Second, for those life events you did experience determine whether the life event was a positive or negative experience for you. For positive experiences, blacken the space [D] on your answer sheet. For negative experiences, blacken the space [NA]. Do not blacken either [D] or [NA] for life events you did not experience. If the life event occurred more than once, and it was positive sometimes and negative others, blacken the response which occurred more frequently. If there is a tie between the number of positive and negative experiences, blacken the response you believe was more stressful.

EXAMPLE: In the survey booklet you marked 2 in the FREQUENCY blank for life event 19, CHANGING JOBS. Now, you determine that CHANGING JOBS was a positive experience the first time and a negative experience the second time. Because there was tie and you considered the negative experience to be more stressful, your response on the answer sheet would be as follows:

[D] ■ 019 [1] [2] [3] [4] [5] [6] [7]

EXPLANATION: Each life event could be considered a positive or a negative experience depending on the circumstances surrounding it. For example, the occurrence of a desirable PROMOTION might be considered a positive experience. To a different person, however, a PROMOTION, which increases their responsibility and work hours, might equally be considered a negative experience. Please keep this distinction in mind when responding.

c. Third, for those life events that did happen to you, determine the extent to which the life event caused you personal stress. If the event did not happen to you, determine the extent to which you believe the event would have caused you personal stress. Personal stress is defined here as your physical and emotional responses, both immediate and delayed, to the conditions surrounding a life event. The extent of stress is measured by the following seven (7) point scale:

1 = To no significant extent
2 = To a very little extent
3 = To a little extent
4 = To a moderate extent
5 = To a fairly large extent
6 = To a large extent
7 = To a very significant extent

Blacken the space on your answer sheet which best describes the extent to which the event caused or would have caused you personal stress. If the event occurred more than once during the specified period, your response should indicate the average extent to which all the occurrences caused you personal stress.

EXAMPLE: Again, you marked 2 in the frequency blank for life event 19, CHANGING JOBS. Then you determined it was a negative experience and blackened [NA] on the answer sheet. Finally, because you changed jobs twice, you determine that the extent of stress caused by CHANGING JOBS the first time was a [2] and the second time was a [6]. The average of both occurrences is a [4]. Therefore, your response on the answer sheet would be as follows:

[D] ■■ 019 [1] [2] [3] ■■ [5] [6] [7] [8] [9]

8. Each of us respond to life events to different extents because of differences in our personalities, our abilities to cope, and our experience with handling a particular life event. For example, a person who easily becomes stressful, who is unwilling to let supportive close-ones help them cope, and who has no experience with major life events, might easily respond with 5, 6, and 7 on many of the events. Before starting the LES, evaluate yourself with respect to personality, coping ability, and experience, so that your responses accurately reflect your personal stress.

APPENDIX H

REVISED LIFE EVENTS SURVEY

GENERAL INFORMATION AND INSTRUCTIONS

1. The Life Events Survey (LES) is a tool designed to identify the events in your life that you find stressful and determine the extent of personal stress resulting from these events.

2. The LES lists eighty-three (83) life events, which are believed to cause personal stress. Personal stress is defined here as your physical and emotional responses, both immediate and delayed, to the conditions surrounding a life event.

3. The life events are divided into three sections: major life events, minor life events, and continuous life events. For each life event which has happened or is happening to you, please provide the following information:

a. Indicate whether it was a positive (P) or negative (N) experience.

b. Except for the continuous life events, indicate how many times the major and minor life events have happened to you during the specified time period.

c. Indicate to what extent the life event was or is stressful for you. The extent of stress is measured by the following seven (7) point scale:

1 = insignificant
2 = very little
3 = little
4 = moderate
5 = fairly large
6 = large
7 = very significant

4. Each of us respond to life events differently because of differences in our personalities, our abilities to cope, and our experience with handling a particular life event. Therefore, it is important that you answer all items honestly. This is the only way an accurate evaluation can be made of life events and the stress they cause.

5. Your individual responses will be held in the strictest confidence, and will not be provided to any organization or persons. Only personnel directly involved in this research will have access to your completed LES.

SECTION I

READ EACH "MAJOR" LIFE EVENT. HAS IT HAPPENED TO YOU?

If NO --- read the next LIFE EVENT.

If YES --- was it a POSITIVE (P) or NEGATIVE (N) experience for you?

If YES --- how many times in the last 2 YEARS or so?

If YES --- to what extent was it stressful for you? (circle one)

1 = insignificant
2 = very little
3 = little
4 = moderate
5 = fairly large
6 = large
7 = very significant

EXAMPLE: Getting injured	(N)	2	1	2	3	4	(5)	6	7
1. Family separation (other than marital separation)	( )	___	1	2	3	4	5	6	7
2. Change in number of family get-togethers.	( )	___	1	2	3	4	5	6	7
3. Birth of a child.	( )	___	1	2	3	4	5	6	7
4. Adoption of a child.	( )	___	1	2	3	4	5	6	7
5. Addition of a non-immediate family dependent to your home.	( )	___	1	2	3	4	5	6	7
6. Offspring leaves home.	( )	___	1	2	3	4	5	6	7
7. Pregnancy	( )	___	1	2	3	4	5	6	7
8. Loss experienced when close-one moves away.	( )	___	1	2	3	4	5	6	7
9. Getting married.	( )	___	1	2	3	4	5	6	7
10. Marriage of a close-one.	( )	___	1	2	3	4	5	6	7
11. Change in marital relationship.	( )	___	1	2	3	4	5	6	7
12. Getting divorced.	( )	___	1	2	3	4	5	6	7
13. Divorce of a close-one.	( )	___	1	2	3	4	5	6	7
14. Marital separation.	( )	___	1	2	3	4	5	6	7
15. Marital reconciliation.	( )	___	1	2	3	4	5	6	7
16. Sex difficulty.	( )	___	1	2	3	4	5	6	7
17. Spouse is unfaithful.	( )	___	1	2	3	4	5	6	7
18. Extramarital affair.	( )	___	1	2	3	4	5	6	7
19. Changing jobs.	( )	___	1	2	3	4	5	6	7
20. Change in job responsibility.	( )	___	1	2	3	4	5	6	7
21. Change of job position (promotion/demotion).	( )	___	1	2	3	4	5	6	7
22. Change of job supervisor.	( )	___	1	2	3	4	5	6	7

READ EACH "MAJOR" LIFE EVENT. HAS IT HAPPENED TO YOU?

If NO --- read the next LIFE EVENT.		If YES --- how many times in the last 2 YEARS or so?	If YES --- to what extent was it stressful for you? (circle one)						
If YES --- was it a POSITIVE (P) or NEGATIVE (N) experience for you?			1 = insignificant 2 = very little 3 = little			4 = moderate 5 = fairly large		6 = large 7 = very significant	
23. Retirement.	( )	___	1	2	3	4	5	6	7
24. Change careers.	( )	___	1	2	3	4	5	6	7
25. Experience job inspection/ evaluation.	( )	___	1	2	3	4	5	6	7
26. Confrontation with supervisor.	( )	___	1	2	3	4	5	6	7
27. Confrontation with co-workers.	( )	___	1	2	3	4	5	6	7
28. Change of employment status.	( )	___	1	2	3	4	5	6	7
29. Change in employment status of spouse.	( )	___	1	2	3	4	5	6	7
30. Buying a house.	( )	___	1	2	3	4	5	6	7
31. Selling a house.	( )	___	1	2	3	4	5	6	7
32. Making other large financial investments.	( )	___	1	2	3	4	5	6	7
33. Experience a financial difficulty.	( )	___	1	2	3	4	5	6	7
34. Change in income.	( )	___	1	2	3	4	5	6	7
35. Experience a tax problem.	( )	___	1	2	3	4	5	6	7
36. Change in commitment to church.	( )	___	1	2	3	4	5	6	7
37. Change in religious beliefs.	( )	___	1	2	3	4	5	6	7
38. Vacation.	( )	___	1	2	3	4	5	6	7
39. Change in recreation routine.	( )	___	1	2	3	4	5	6	7
40. Required to move.	( )	___	1	2	3	4	5	6	7
41. House damaged.	( )	___	1	2	3	4	5	6	7
42. Change in relationship with a close-one.	( )	___	1	2	3	4	5	6	7
43. Counseling employees.	( )	___	1	2	3	4	5	6	7
44. Death of a close-one.	( )	___	1	2	3	4	5	6	7
45. Acute personal medical problem.	( )	___	1	2	3	4	5	6	7
46. Acute medical problem of a close-one.	( )	___	1	2	3	4	5	6	7

READ EACH "MAJOR" LIFE EVENT. HAS IT HAPPENED TO YOU?

If NO --- read the next LIFE EVENT.	If YES --- was it a POSITIVE (P) or NEGATIVE (N) experience for you?	If YES --- how many times in the last 2 YEARS or so?	If YES --- to what extent was it stressful for you? (circle one) 1 = insignificant, 2 = very little, 3 = little, 4 = moderate, 5 = fairly large, 6 = large, 7 = very significant						
47. Change in social participation.	( )	___	1	2	3	4	5	6	7
48. Victim of a crime.	( )	___	1	2	3	4	5	6	7
49. Close-one is a victim of a crime.	( )	___	1	2	3	4	5	6	7
50. Socializing with high officials.	( )	___	1	2	3	4	5	6	7
51. Activities associated with holidays.	( )	___	1	2	3	4	5	6	7
52. Legal problems.	( )	___	1	2	3	4	5	6	7
53. Outstanding personal achievement.	( )	___	1	2	3	4	5	6	7
54. Starting school/training.	( )	___	1	2	3	4	5	6	7
55. Graduating from school/training.	( )	___	1	2	3	4	5	6	7
56. Close-one is starting school/training.	( )	___	1	2	3	4	5	6	7
57. Close-one is graduating from school/training.	( )	___	1	2	3	4	5	6	7
58. Academic efforts (exam/paper).	( )	___	1	2	3	4	5	6	7

SECTION 2

READ EACH "MINOR" LIFE EVENT. HAS IT HAPPENED TO YOU?

If NO --- read the next LIFE EVENT.

If YES --- was it a POSITIVE (P) or NEGATIVE (N) experience for you?

If YES --- how many times in the last 2 WEEKS or so?

If YES --- to what extent was it stressful for you? (circle one)

1 = insignificant
2 = very little
3 = little
4 = moderate
5 = fairly large
6 = large
7 = very significant

EXAMPLE: Getting injured	(N)	2	1	2	3	4	5	(6)	7
59. Briefing superiors.	( )	___	1	2	3	4	5	6	7
60. Job requires much traveling.	( )	___	1	2	3	4	5	6	7
61. Car problems.	( )	___	1	2	3	4	5	6	7
62. Dealing with financial problems of a close-one.	( )	___	1	2	3	4	5	6	7
63. Home maintenance.	( )	___	1	2	3	4	5	6	7
64. Supervising peers.	( )	___	1	2	3	4	5	6	7
65. Driving in rush hour traffic.	( )	___	1	2	3	4	5	6	7
66. Change in daily routine.	( )	___	1	2	3	4	5	6	7
67. Frequent social obligations.	( )	___	1	2	3	4	5	6	7
68. Misplacing or losing things.	( )	___	1	2	3	4	5	6	7

READ EACH "CONTINUOUS" LIFE EVENT. IS IT HAPPENING TO YOU?

If NO --- read the next LIFE EVENT.	If YES --- is it a POSITIVE (P) or NEGATIVE (N) experience for you?	If YES --- to what extent is it stressful for you? (1 = insignificant, 2 = very little, 3 = little, 4 = moderate, 5 = fairly large, 6 = large, 7 = very significant)						
EXAMPLE:								
Office bickering.	(N)	1	2	3	4	5	(6)	7
69. Responsibility of being a parent.	( )	1	2	3	4	5	6	7
70. Family bickering.	( )	1	2	3	4	5	6	7
71. Responsibility of marriage.	( )	1	2	3	4	5	6	7
72. Uncomfortable job environment.	( )	1	2	3	4	5	6	7
73. Job responsibility and pressures	( )	1	2	3	4	5	6	7
74. Inability to accomplish job.	( )	1	2	3	4	5	6	7
75. Continuous financial problems.	( )	1	2	3	4	5	6	7
76. Continuous church responsibilities.	( )	1	2	3	4	5	6	7
77. Frequent recreation routine (daily workout).	( )	1	2	3	4	5	6	7
78. Chronic personal medical problem.	( )	1	2	3	4	5	6	7
79. Chronic medical problem of a close-one.	( )	1	2	3	4	5	6	7
80. Eating or drinking too much.	( )	1	2	3	4	5	6	7
81. Maintaining physical appearance/ self image.	( )	1	2	3	4	5	6	7
82. Maintaining life style.	( )	1	2	3	4	5	6	7
83. Pressures of attending school/ training.	( )	1	2	3	4	5	6	7

ADDITIONAL LIFE EVENTS

In the blanks provided below, list the major, minor, and continuous life events, which you believe were not covered by the LES. In the spaces provided please indicate the frequency of occurrence, and whether it was a positive (P) or negative (N) experience.

EXAMPLE:

Purchase of a pet	5	P

LIFE EVENT	FREQUENCY	POS (P)/NEG (N)

APPENDIX I

TABLES OF PERCENT FREQUENCIES OF LIFE EVENT OCCURRENCES, POSITIVE VERSUS NEGATIVE ASSESSMENTS, FREQUENCY COUNTS, AND EXTENTS OF STRESS

Table 16

Percent Frequencies of Major Life Event Occurrences and Positive Versus Negative Assessment

Event	% Occurrence	% Positive	% Negative
1. Family Separation (other than marital separation)	58	35	65
2. Change in Number of Family Get-togethers	34	47	53
3. Birth of a Child	10	78	22
4. Adoption of a Child	1	100	0
5. Addition of a Nonimmediate Family Dependent to Home	4	75	25
6. Offspring Leaves Home	12	27	73
7. Pregnancy	13	67	33
8. Loss Experienced When Close-one Moves Away	25	27	73
9. Getting Married	12	82	18
10. Marriage of a Close-one	14	92	8
11. Change in Marital Relationship	16	20	80
12. Getting Divorced	15	29	71
13. Divorce of a Close-one	11	30	70
14. Marital Separation	17	25	75
15. Marital Reconciliation	9	75	25
16. Sex Difficulty	20	5	95
17. Spouse is Unfaithful	11	10	90
18. Extramarital Affair	17	50	50
19. Changing Jobs	65	69	31
20. Change in Job Responsibility	66	61	39
21. Change of Job Position (Promotion/ Demotion)	53	77	23
22. Change of Job Supervisor	73	57	43
23. Retirement	3	100	0
24. Change Careers	11	80	20

Table 16 (Continued)

Event		% Occurrence	% Positive	% Negative
25.	Experience Job Inspection/ Evaluation	58	59	41
26.	Confrontation with Supervisor	54	16	84
27.	Confrontation with Co-Workers	42	15	85
28.	Change of Employment Status	13	67	33
29.	Change in Employment Status of Spouse	27	52	48
30.	Buying a House	48	87	13
31.	Selling a House	29	56	44
32.	Making Other Large Financial Investments	52	81	19
33.	Experience a Financial Difficulty	37	3	97
34.	Change in Income	60	70	30
35.	Experience a Tax Problem	20	11	89
36.	Change in Commitment to Church	20	74	26
37.	Change in Religious Beliefs	9	75	25
38.	Vacation	81	93	7
39.	Change in Recreation Routine	33	57	43
40.	Required to Move	48	55	45
41.	House Damaged	15	14	86
42.	Change in Relationship with a Close-One	33	29	71
43.	Counseling Employees	30	46	54
44.	Death of a Close-One	31	14	86
45.	Acute Personal Medical Problem	19	6	94
46.	Acute Medical Problem of a Close-One	42	8	92
47.	Change in Social Participation (Join a Committee)	32	59	41
48.	Victim of a Crime	9	0	100
49.	Close-One is a Victim of a Crime	10	12	88

Table 16 (Continued)

Event	% Occurrence	% Positive	% Negative
50. Socializing with High Officials	30	81	19
51. Activities Associated w/Holidays	69	83	17
52. Legal Problems	22	0	100
53. Outstanding Personal Achievement	49	96	4
54. Starting School/Training	42	74	26
55. Graduating from School/Training	18	94	6
56. Close-One Starting School/Training	31	76	24
57. Close-One Graduates from School/ Training	22	95	5
58. Academic Efforts (Exam/Paper)	42	36	64

Table 17

Percent Frequencies of Minor Life Event Occurrences and Positive Versus Negative Assessment

Event	% Occurrence	% Positive	% Negative
59. Briefing Superiors	57	68	32
60. Job Requires Much Travelling	19	61	39
61. Car Problems	52	4	96
62. Dealing with Financial Problems of Close-Ones	24	23	77
63. Home Maintenance	57	33	67
64. Supervising Peers	23	48	52
65. Driving in Rush Hour Traffic	58	9	91
66. Change in Daily Routine	26	57	43
67. Frequent Social Obligations	27	50	50
68. Misplacing or Losing Things	45	10	90

Table 18

Percent Frequencies of Continuous Life Event Occurrences and Positive Versus Negative Assessment

Event	% Occurrence	% Positive	% Negative
69. Responsibility of Being a Parent	59	75	25
70. Family Bickering	39	8	92
71. Responsibility of Marriage	63	79	21
72. Uncomfortable Job Environment	42	5	95
73. Job Responsibility and Pressures	73	39	61
74. Inability to Accomplish Job	22	10	90
75. Continuous Financial Problems	25	9	91
76. Continuous Church Responsibilities	18	76	24
77. Frequent Recreation Routine (Daily Workout)	34	88	12
78. Chronic Personal Medical Problem	19	6	94
79. Chronic Medical Problem of Close-One	38	9	91
80. Eating or Drinking too Much	30	7	93
81. Maintaining Physical Appearance/ Self-Image	78	59	41
82. Maintaining Life Style	55	75	25
83. Pressures of Attending School/ Training	29	26	74

Table 19

Ranges, Means, and Standard Deviations for Major Life Event Frequency Counts and Extents of Stress

Event	Frequency Counts				Extent of Stress Caused	
	Min	Max	$\bar{x}$	σ	$\bar{x}$	σ
1. Family Separation (Other Than Marital Separation)	1	25	5.148	5.711	3.759	1.625
2. Change in Number of Family Get-Togethers	1	6	2.000	1.225	3.875	1.385
3. Birth of a Child	1	1	1.000	0.000	4.444	1.944
4. Adoption of a Child	1	1	1.000	0.000	4.000	0.000
5. Addition of a Nonimmediate Family Dependent to Home	1	2	1.250	0.500	3.750	1.708
6. Offspring Leaves Home	1	2	1.300	0.483	4.000	1.342
7. Pregnancy	1	2	1.182	0.405	4.500	1.834
8. Loss Experienced when Close-One Moves Away	1	3	1.333	0.577	4.348	1.465
9. Getting Married	1	2	1.100	0.316	5.000	1.897
10. Marriage of a Close-One	1	2	1.083	0.289	4.000	1.528
11. Change in Marital Relationship	1	3	1.462	0.776	6.267	1.163
12. Getting Divorced	1	1	1.000	0.000	5.929	1.817
13. Divorce of a Close-One	1	2	1.300	0.483	4.600	1.578
14. Marital Separation	1	2	1.286	0.469	5.563	1.413
15. Marital Reconciliation	1	2	1.143	0.378	5.000	1.512
16. Sex Difficulty	1	12	3.429	3.298	4.632	1.342
17. Spouse is Unfaithful	1	2	1.143	0.378	5.600	1.776
18. Extramarital Affair	1	2	1.133	0.352	4.813	1.797
19. Changing Jobs	1	4	1.550	0.891	4.966	1.531
20. Change in Job Responsibility	1	4	1.633	0.920	4.852	1.352
21. Change of Job Position (promotion/demotion)	1	4	1.551	0.914	4.286	1.791

Table 19 (Continued)

Event	Frequency Counts				Extent of Stress Caused	
	Min	Max	$\bar{x}$	σ	$\bar{x}$	σ
22. Change of Job Supervisor	1	5	1.791	1.023	4.368	1.656
23. Retirement	1	1	1.000	0.000	5.667	1.155
24. Change Careers	1	2	1.100	0.316	5.200	1.989
25. Experience Job Inspection/Evaluation	1	6	2.037	1.165	3.704	1.513
26. Confrontation with Supervisor	1	50	3.872	7.134	5.120	1.698
27. Confrontation with Co-Workers	1	30	3.892	5.098	4.538	1.570
28. Change of Employment Status	1	6	1.833	1.528	4.250	1.603
29. Change in Employment Status of Spouse	1	5	1.520	1.085	4.560	1.530
30. Buying a House	1	2	1.048	0.216	4.733	1.543
31. Selling a House	1	1	1.000	0.000	4.400	1.384
32. Making Other Large Financial Investments	1	25	2.064	3.535	4.021	1.495
33. Experience a Financial Difficulty	1	24	2.706	4.160	4.824	1.547
34. Change in Income	1	6	1.625	1.054	3.893	1.885
35. Experience a Tax Problem	1	2	1.105	0.315	3.684	1.565
36. Change in Commitment to Church	1	2	1.056	0.236	4.000	1.667
37. Change in Religious Beliefs	1	2	1.125	0.354	4.250	1.669
38. Vacation	1	5	2.247	1.128	3.840	1.816
39. Change in Recreation Routine	1	6	1.767	1.357	3.600	1.354
40. Required to Move	1	5	1.467	0.968	4.422	1.672
41. House Damaged	1	2	1.231	0.439	4.357	1.499

Table 19 (Continued)

Event	Frequency Counts				Extent of Stress Caused	
	Min	Max	$\bar{x}$	σ	$\bar{x}$	σ
42. Change in Relationship With a Close-One	1	4	1.379	0.728	5.161	1.463
43. Counseling Employees	1	40	5.750	7.849	4.107	1.397
44. Death of a Close-One	1	3	1.179	0.476	5.414	1.524
45. Acute Personal Medical Problem	1	4	1.500	0.857	5.056	1.862
46. Acute Medical Problem of a Close-One	1	6	1.615	1.115	5.205	1.218
47. Change in Social Participation (Join a Committee)	1	5	1.690	1.039	3.767	1.478
48. Victim of a Crime	1	2	1.250	0.463	4.750	2.252
49. Close-One is a Victim of a Crime	1	1	1.000	0.000	5.000	1.581
50. Socializing with High Officials	1	10	3.556	2.439	3.571	1.501
51. Activities Associated with Holidays	1	20	3.794	3.303	4.031	1.553
52. Legal Problems	1	10	1.700	2.029	4.850	1.814
53. Outstanding Personal Achievement	1	6	1.698	1.166	3.800	1.740
54. Starting School/ Training	1	6	1.378	0.924	4.359	1.442
55. Graduating from School/ Training	1	2	1.250	0.447	2.882	1.495
56. Close-One Starting School/Training	1	3	1.172	0.539	3.517	1.785
57. Close-One Graduating from School/Training	1	3	1.368	0.597	4.050	1.932
58. Academic Efforts (Exam/ Paper)	1	20	4.639	4.642	4.077	1.365

Table 20

Ranges, Means, and Standard Deviations for Minor Life Event Frequency Counts and Extents of Stress

Event	Frequency Counts				Extent of Stress Caused	
	Min	Max	$\bar{x}$	σ	$\bar{x}$	σ
59. Briefing Supervisors	1	99	5.019	13.619	3.528	1.409
60. Job Requires Much Travelling	1	2	1.176	0.393	3.722	1.274
61. Car Problems	1	5	1.689	1.062	4.042	1.473
62. Dealing with Financial Problems of Close-Ones	1	6	1.955	1.290	4.136	1.552
63. Home Maintenance	1	15	2.020	2.168	3.596	1.472
64. Supervising Peers	1	10	4.000	3.873	3.333	1.426
65. Driving in Rush Hour Traffic	1	28	6.392	6.350	3.538	1.590
66. Change in Daily Routine	1	14	3.409	3.050	3.458	1.062
67. Frequent Social Obligations	1	10	3.000	2.519	3.240	1.535
68. Misplacing or Losing Things	1	50	3.923	8.576	3.619	1.431

Table 21

Means and Standard Deviations for Extents of Stress Caused by Continuous Life Events

Event	Extent of Stress Caused	
	$\bar{x}$	σ
69. Responsibility of Being a Parent	4.727	1.581
70. Family Bickering	4.472	1.540
71. Responsibility of Marriage	3.930	1.944
72. Uncomfortable Job Environment	4.513	1.554
73. Job Responsibilities and Pressures	4.265	1.389
74. Inability to Accomplish Job	4.450	1.317
75. Continuous Financial Problems	4.304	1.636
76. Continuous Church Responsibilities	3.529	1.940
77. Frequent Recreation Routine (Daily Workout)	3.688	1.925
78. Chronic Personal Medical Problem	4.333	1.572
79. Chronic Medical Problem of a Close-One	4.857	1.240
80. Eating or Drinking Too Much	4.143	1.557
81. Maintaining Physical Appearance/Self-Image	3.932	1.521
82. Maintaining Life Style	3.784	1.540
83. Pressures of Attending School/Training	4.556	1.219

APPENDIX J

TABLES OF PEARSON r CORRELATION COEFFICIENT MATRICES FOR LIFE EVENTS

Table 22

Pearson Correlation Matrix for Major Life Events[2]
(Figures have been rounded to two significant places)

Events / Event #s	1	2	3	4	5	6	7	8	9
1. Family separation (other than marital separation)	1.00	0.48**	0.76	****	0.50	0.89**	-0.46	0.25	-0.19
2. Change in number of family get-togethers	—	1.00	0.74	****	****	****	-0.88*	0.50*	0.59
3. Birth of a child		—	1.00	****	****	****	0.85*	1.00[1]	1.00[1]
4. Adoption of a child			—	1.00	****	****	****	****	****
5. Addition of a nonimmediate family dependent to home				—	1.00	****	****	-1.00[1]	****
6. Offspring leaves home					—	1.00	****	0.60	****
7. Pregnancy						—	1.00	****	0.97*
8. Loss experienced when close-one moves away							—	1.00	0.58
9. Getting married								—	1.00

Table 22 (Continued)

Event	Event #s	10	11	12	13	14	15	16	17	18	19	20
1		0.36	-0.25	0.16	0.25	0.44	0.73*	0.27	0.87*	-0.84**	0.23	-0.01
2		0.61	-0.39	-0.08	0.44	0.20	0.86*	0.55	-0.52	-0.03	0.41*	0.16
3		0.97	****	1.00[1]	-0.87	****	1.00[1]	0.98	****	****	0.16	0.05
4		****	****	****	****	****	****	****	****	****	****	****
5		****	****	****	****	****	****	1.00[1]	****	****	****	0.45
6		****	****	-0.50	****	****	****	0.50	****	-1.00[1]	0.63	0.02
7		****	****	1.00[1]	-1.00[1]	****	****	1.00[1]	****	****	0.66*	0.00
8		0.77	-0.38	****	0.60	-0.50	****	0.25	****	0.50	0.44	-0.04
9		****	-0.50	****	1.00[1]	-0.52	****	1.00[1]	****	****	0.56*	0.42

Table 22 (Continued)

Event	Event #s 21	22	23	24	25	26	27	28	29	30	31
1	0.15	-0.00	****	0.05	-0.02	-0.10	0.13	0.38	0.04	-0.16	-0.36
2	0.07	0.16	****	0.69	-0.01	-0.21	0.11	-0.02	-0.47	0.06	0.17
3	0.87	0.67	****	1.00[1]	-0.44	-0.09	0.81*	1.00[1]	0.69	0.69	****
4	****	****	****	****	****	****	****	****	****	****	****
5	****	-0.29	****	****	0.00	****	****	****	****	1.00[1]	-1.00[1]
6	0.35	0.00	****	****	0.50	0.03	-0.54	****	-1.00[1]	0.00	-0.76
7	0.57	0.84**	****	0.92	-0.17	0.45	0.58	0.76	0.98**	0.78*	****
8	0.74**	0.11	****	1.00[1]	0.41*	0.02	-0.52	0.29	0.60	0.25	0.28
9	0.99***	0.23	****	1.00[1]	-0.33	-0.10	0.22	0.50	0.48	-0.14	0.00

Table 22 (Continued)

Event	Event #s 32	33	34	35	36	37	38	39	40	41	42
1	-0.43*	0.21	0.23	-0.01	0.15	-0.98	0.34*	0.34	0.29	-0.45	0.12
2	-0.14	-0.23	0.22	-0.36	-0.23	-0.50	0.47**	0.33	0.35	-0.75**	0.29
3	0.31	0.33	0.91*	****	-1.00[1]	****	0.15	****	-1.00[1]	****	****
4	****	****	****	****	****	****	****	****	****	****	****
5	****	****	-1.00[1]	-1.00[1]	****	****	****	****	****	****	-1.00[1]
6	0.74	0.86	0.37	0.94	-1.00[1]	****	0.14	****	-0.67	1.00[1]	0.47
7	0.82*	0.72	0.73*	0.96	****	****	0.74**	0.56	0.73*	0.80	0.75
8	-0.24	0.40	0.36	0.23	-0.62	-0.87	0.21	0.22	-0.10	0.03	-0.25
9	0.29	0.33	0.70*	0.25	-0.13	-1.00[1]	0.87**	0.88*	-0.10	1.00[1]	0.43

Table 22 (Continued)

Event	Event #s 43	44	45	46	47	48	49	50	51	52	53
1	0.29	-0.03	-0.18	-0.26	0.29	0.22	0.21	0.08	0.08	-0.13	0.25
2	0.22	-0.75**	-0.77**	-0.35	0.40	0.43	0.00	0.53	0.03	0.28	0.27
3	1.00[1]	0.00	****	-0.53	****	****	****	****	0.49	****	0.94*
4	****	****	****	****	****	****	****	****	****	****	****
5	****	****	****	1.00[1]	****	****	****	****	1.00[1]	****	0.87
6	0.87	****	1.00[1]	0.89*	-0.69	****	****	****	0.69	-1.00[1]	0.48
7	0.72	0.49	1.00[1]	0.22	0.08	****	****	-1.00[1]	0.85**	1.00***	0.82*
8	-0.15	-0.31	0.10	0.14	0.01	****	-0.55	0.14	0.19	0.95**	0.37
9	0.27	-0.17	-0.52	0.37	0.56	****	-1.00[1]	****	0.48	0.52	0.72*

Table 22 (Continued)

Event	Event #s 54	55	56	57	58
1	0.10	0.20	-0.06	0.14	0.22
2	-0.12	0.43	0.37	0.55	0.38
3	-1.00[1]	****	1.00[1]	0.60	-1.00[1]
4	****	****	****	****	****
5	****	****	-1.00[1]	-1.00[1]	1.00[1]
6	****	1.00[1]	-0.82*	-0.48	0.50
7	-0.18	0.11	0.81*	0.92	0.13
8	0.16	0.36	0.36	0.44	0.48*
9	-0.20	0.87*	0.66*	0.91	0.60

Table 22 (Continued)

Event / Event #s	10	11	12	13	14	15	16	17	18
10. Marriage of a close-one	1.00	****	****	-0.87	****	1.00[1]	****	****	****
11. Change in marital relationship		1.00	0.62*	****	0.65*	0.50	-0.19	1.00***	0.28
12. Getting divorced			1.00	0.50	0.28	0.00	****	0.65	0.66*
13. Divorce of a close-one				1.00	1.00[1]	-0.5	****	0.00	-0.50
14. Marital separation					1.00	0.56	0.50	-0.10	0.10
15. Marital reconciliation						1.00	****	-0.87*	-0.16
16. Sex difficulty							1.00	0.33	0.00
17. Spouse is unfaithful								1.00	0.54
18. Extra-marital affair									1.00
19. Changing jobs									
20. Change in job responsibility									
21. Change of job position (promotion/demotion)									
22. Change of job supervisor									
23. Retirement									

Table 22 (Continued)

Event	Event #s 19	20	21	22	23	24	25	26	27	28	29
10	-0.32	-0.33	-0.23	-0.08	****	****	0.09	0.14	0.57	****	0.00
11	0.72**	-0.07	0.50	0.41	****	****	0.12	0.50	0.52	****	0.73
12	0.48	-0.02	-0.21	-0.11	1.00[1]	****	-0.08	-0.10	0.37	****	****
13	0.70	-0.28	-0.84	0.06	****	****	0.00	-0.46	-0.85*	****	0.19
14	0.55*	0.24	0.29	0.72**	****	****	0.21	0.36	0.34	0.50	0.51
15	0.76	0.95*	0.51	0.16	****	****	****	0.54	0.47	****	0.00
16	0.71	0.41	0.63*	0.36	****	1.00[1]	0.14	0.43	0.50	0.72	0.19
17	0.28	-0.97	0.41	-0.72	****	****	0.61	-0.59	-0.53	****	****
18	0.36	0.06	0.07	0.22	1.00[1]	****	0.19	0.36	0.36	****	-0.50
19	1.00	0.59***	0.64***	0.55***	1.00[1]	0.26	0.04	0.52**	0.60**	0.29	0.71**
20		1.00	0.44**	0.43**	****	0.03	0.07	0.47**	0.36*	0.08	0.30
21			1.00	0.70***	****	-0.14	0.35*	0.25	0.45*	-0.31	0.62*
22				1.00	****	0.15	0.13	0.23	0.37*	-0.18	0.47*
23					1.00	****	****	****	****	****	****

Table 22 (Continued)

Event	Event #s 30	31	32	33	34	35	36	37	38	39	40
10	-0.06	0.29	0.65	-0.77	0.00	1.00[1]	-0.50	****	0.03	-0.87	-0.18
11	0.40	0.19	0.15	0.14	0.17	****	-0.69	****	-0.06	0.19	0.37
12	-0.53	****	-0.37	0.00	-0.19	-1.00[1]	****	****	0.04	-0.10	-0.11
13	0.43	0.87	0.41	1.00[1]	-0.13	****	-0.75	0.17	0.63*	0.75	-0.69
14	0.67*	0.45	-0.03	-0.20	-0.11	****	-0.83	****	0.31	-0.25	0.35
15	0.31	0.68*	-1.00[1]	-0.76	0.73	****	-0.28	****	0.04	-0.76	0.83*
16	0.15	0.91*	0.28	-0.20	0.27	0.00	****	1.00[1]	0.22	0.15	0.07
17	-0.87	-0.60	-0.60	****	-0.48	****	****	0.98	-0.07	0.33	-0.30
18	-0.35	-0.47	0.31	-0.14	-0.20	****	0.67	0.97	-0.04	-0.24	0.04
19	0.48**	0.38	0.22	0.47**	0.42**	0.24	0.05	-0.14	0.29*	0.42*	0.47**
20	0.15	0.11	0.01	-0.01	0.16	-0.24	0.56*	0.90*	0.09	0.08	0.27
21	0.36*	0.44*	0.37	0.02	0.50**	0.44	0.41	-0.17	0.27*	0.31	0.48**
22	0.23	-0.14	0.27	0.14	0.19	-0.07	0.26	0.00	0.10	0.32	0.24
23	****	****	****	1.00[1]	1.00[1]	****	****	****	****	****	****

Table 22 (Continued)

Event	Event #s 41	42	43	44	45	46	47	48	49	50	51
10	****	0.26	****	0.11	****	-0.66*	0.00	-1.00[1]	1.00[1]	0.67	0.12
11	0.78	0.59*	0.29	0.87*	-0.31	0.68	0.48	0.00	-0.50	0.38	0.48
12	****	-0.11	-0.16	0.09	0.04	0.22	-0.06	0.00	0.32	-0.02	0.51
13	0.87	0.47	****	-1.00[1]	-1.00[1]	0.18	-0.02	****	0.87	****	0.35
14	-0.19	0.39	0.42	0.48	-0.16	0.57*	0.62	-1.00***	-0.18	0.39	0.06
15	1.00[1]	0.37	1.00[1]	-0.52	-1.00[1]	-0.22	0.95*	****	****	****	0.14
16	****	0.65	0.68*	0.06	0.85*	0.59	-0.32	****	0.80	0.34	-0.16
17	****	0.28	1.00[1]	-0.33	1.00[1]	0.89*	-0.37	****	0.90	0.65	-0.32
18	0.00	0.01	-0.14	0.43	-0.81*	0.52	-0.19	1.00[1]	0.26	0.79	0.10
19	0.73*	0.47*	0.44*	0.38	0.18	0.28	0.33	0.55	-0.30	0.24	0.41**
20	0.18	0.02	0.37	0.16	0.08	0.39*	0.36*	0.28	-0.38	-0.09	0.15
21	0.07	0.33	0.17	0.32	0.10	0.40*	0.36	0.50	-0.48	0.29	0.18
22	0.21	0.18	0.28	0.45*	0.09	0.17	0.16	0.52	-0.34	-0.04	0.16
23	****	****	****	****	****	****	****	****	****	****	****

Table 22 (Continued)

Event	Event #s 52	53	54	55	56	57	58
10	****	0.52	-0.52	-0.94	-0.19	-1.00	-0.38
11	-0.08	0.20	-0.06	0.25	0.62	****	-0.10
12	0.22	-0.44	-0.59	****	****	****	-0.35
13	0.88	0.30	-0.91*	0.28	0.25	-0.65	0.28
14	0.81*	0.00	-0.15	-0.65	0.47	0.63	-0.17
15	0.89	0.54	0.42	****	0.64	-0.94	0.30
16	-0.13	0.63*	-0.05	0.22	0.86*	0.97**	0.45
17	-0.41	-0.71	-0.71	****	-0.56	****	-0.66
18	-0.01	-0.53	-0.50	-0.19	0.31	0.19	-0.76
19	0.31*	0.22	-0.14	0.53**	0.26	0.18	0.15
20	0.25	-0.02	0.25	-0.29	0.02	-0.29	-0.05
21	0.54	0.37*	0.30	0.25	0.66**	0.65**	0.50**
22	0.31	0.20	0.30*	-0.35	0.41*	-0.08	0.19
23	1.00[1]	****	****	****	****	****	****

Table 22 (Continued)

Event	Event #s	24	25	26	27	28	29	30	31	32
24. Change careers		1.00	0.69*	-0.02	-0.16	0.90	****	0.49	****	0.52
25. Experience job inspection/evaluation			1.00	0.15	-0.08	0.56*	0.45*	0.42	0.35	0.42**
26. Confrontation with supervisor				1.00	0.73***	0.19	0.69**	0.15	0.34	0.20
27. Confrontation with co-workers					1.00	0.04	0.47*	0.30	0.39	0.37
28. Change of employment status						1.00	0.64	0.75	****	0.18
29. Change of employment status of spouse							1.00	0.52*	-0.05	0.08
30. Buying a house								1.00	0.55**	0.43*
31. Selling a house									1.00	0.44
32. Making other large financial investments										1.00
33. Experience a financial difficulty										
34. Change in income										
35. Experience a tax problem										

Table 22 (Continued)

Event	Event #s 33	34	35	36	37	38	39	40	41	42	43
24	0.49	0.36	0.50	0.00	-1.00[1]	0.74*	0.50	0.78*	0.56	0.81	0.78
25	0.37	0.41	0.42	0.03	0.39	0.24	0.07	0.50**	0.30	0.19	0.29
26	0.45*	0.35*	0.27	0.33	-0.87*	0.17	0.12	-0.08	0.28	0.13	0.28
27	0.10	0.32*	0.33	0.08	****	0.21	-0.08	0.18	0.25	0.12	0.50*
28	0.77*	0.27	0.97*	0.13	****	0.61	0.53	0.86*	-1.00***	0.35	0.89
29	0.82**	0.45*	0.62	-0.21	-0.50	0.01	0.07	0.17	0.39	-0.05	0.69*
30	0.60**	0.39*	0.54*	-0.24	0.19	0.28	0.11	0.57**	0.07	-0.27	0.30
31	0.01	0.48*	0.51	-0.30	0.00	0.43*	0.50	0.49*	0.71*	0.57*	-0.15
32	0.47*	0.08	0.68**	0.22	0.50	0.33*	0.09	0.16	0.67*	0.40*	0.31
33	1.00	0.57**	0.79**	0.09	-0.87	0.29	0.51*	0.52*	0.69	-0.06	0.40
34		1.00	0.17	0.19	-0.87*	0.55***	0.38*	0.60***	0.45	0.15	0.28
35			1.00	-0.10	****	0.16	0.02	0.56*	0.72	-0.21	0.60*

Table 22 (Continued)

Event	Event #s 44	45	46	47	48	49	50	51	52	53	54
24	0.10	****	0.08	0.73*	****	****	1.00[1]	0.77*	0.87	0.69	-0.58
25	0.48	0.37	0.39*	0.12	0.89**	0.06	0.59**	0.05	0.57*	0.03	-0.11
26	0.30	0.20	0.57**	0.33	0.76*	-0.41	0.16	0.30*	0.18	-0.01	-0.02
27	0.53*	-0.66*	0.52*	0.17	0.77	-0.87	0.28	0.46	0.01	0.00	0.18
28	0.00	****	-0.52	0.72	****	1.00[1]	1.00[1]	0.24	0.52	-0.51	-0.16
29	0.29	0.60	0.75**	0.75*	****	-1.00[1]	0.00	0.66**	0.87**	-0.11	0.24
30	-0.07	0.61*	0.43*	-0.01	****	-0.51	0.46	0.10	0.24	0.08	-0.19
31	-0.57	0.72	0.42	0.25	0.87	-0.19	0.09	0.05	0.12	0.03	-0.46
32	0.42	-0.21	0.34	-0.29	0.62	-0.74	0.16	0.36*	-0.06	0.13	-0.42*
33	0.32	0.59	0.41	-0.18	0.61	1.00***	0.16	0.45*	0.30	0.11	-0.44*
34	0.62**	0.26	0.44*	0.29	0.62	-0.40	0.22	0.24	0.40	0.50**	-0.13
35	1.00***	1.00[1]	0.25	0.01	****	0.50	0.44	0.31	0.47	-0.09	-0.17

Table 22 (Continued)

Event	Event #s 55	56	57	58
24	0.87	0.96**	****	0.26
25	0.28	0.11	0.22	0.34*
26	-0.12	0.17	0.31	0.10
27	-0.53	0.45	0.46	-0.01
28	0.28	0.28	0.80	0.64
29	-0.13	0.59*	0.48	0.67**
30	0.32	0.26	0.53	0.13
31	0.24	0.20	0.45	-0.05
32	-0.07	0.50*	0.35	-0.23
33	-0.01	-0.05	-0.14	0.29
34	0.06	0.25	0.70**	0.38*
35	0.06	-0.42	0.09	0.60*

Table 22 (Continued)

Event / Event #s	36	37	38	39	40	41	42	43	44
36. Change in commitment to church	1.00	0.76	0.34	0.17	0.33	-0.65	-0.23	-0.33	0.43
37. Change in religious beliefs		1.00	-0.60	-0.69	0.21	****	-0.63	****	0.00
38. Vacation			1.00	0.60***	0.38**	-0.08	0.20	0.19	0.22
39. Change in recreation routine				1.00	0.24	0.43	0.51*	-0.20	0.27
40. Required to move					1.00	0.51	0.24	0.34	0.66**
41. House damaged						1.00	0.59*	0.03	0.45
42. Change in relationship with a close-one							1.00	0.10	0.23
43. Counseling employees								1.00	0.42
44. Death of a close-one									1.00
45. Acute personal medical problem									
46. Acute medical problem of a close-one									
47. Change in social participation (join a committee)									

Table 22 (Continued)

Event	Event #s 45	46	47	48	49	50	51	52	53	54	55
36	0.56	0.00	0.41	1.00[1]	****	-0.13	0.17	-1.00***	0.42	0.46	-0.08
37	****	0.50	0.65	****	****	****	-0.65	-0.94	0.50	0.74	-1.00[1]
38	-0.18	0.10	0.44**	0.45	0.09	0.25	0.50***	0.14	0.64***	-0.37*	0.31
39	0.37	-0.58*	0.31	0.41	0.14	-0.17	0.53**	-0.13	0.61**	-0.39*	0.53*
40	-0.51	0.44*	0.56**	0.78	-0.21	0.77***	0.27	0.78**	0.22	0.02	0.03
41	-0.54	0.48	-0.12	1.00[1]	0.18	0.45	0.64*	0.10	0.31	-0.58	-0.16
42	-0.73*	-0.27	0.47*	1.00[1]	0.06	-0.02	0.19	-0.03	0.13	-0.34	0.09
43	0.00	0.49*	0.12	-0.65	0.83*	0.40	0.16	0.64*	-0.06	0.14	-0.55
44	-0.31	0.30	0.38	-1.00[1]	-0.80	0.19	0.43*	0.42	0.27	0.24	-0.54
45	1.00	0.27	0.28	1.00[1]	0.70	-0.52	0.02	-0.20	0.13	-0.10	0.36
46		1.00	0.27	0.00	0.17	0.37	0.31*	0.47	-0.28	0.00	0.02
47			1.00	0.80	-0.48	0.23	0.30	0.76**	0.38*	0.20	0.63*

Table 22 (Continued)

Event	Event #s 56	57	58
36	0.03	0.68	0.00
37	0.19	****	-0.05
38	0.54**	0.60**	-0.01
39	0.31	0.13	0.34
40	0.12	-0.19	-0.03
41	0.27	-0.59	-0.70
42	0.52*	0.06	-0.01
43	0.48	0.27	0.38
44	-0.08	-0.11	-0.13
45	-0.54	0.23	0.36
46	0.12	-0.05	0.11
47	0.65*	0.94**	0.09

Table 22 (Continued)

Event	Event #s	48	49	50	51	52	53
48. Victim of a crime		1.00	****	-0.98	0.40	****	0.40
49. Close-one is a victim of a crime			1.00	-0.10	-0.15	0.87	-0.03
50. Socializing with high officials				1.00	-0.04	0.80**	-0.16
51. Activities associated with holidays					1.00	0.02	0.47**
52. Legal problems						1.00	0.11
53. Outstanding personal achievement							1.00
54. Starting school/training							
55. Graduating from school/ training							
56. Close-one starting school/ training							
57. Close-one graduating from school/training							
58. Academic efforts (exam/paper)							

Table 22 (Continued)

Event	Event #s 54	55	56	57	58
48	-0.44	****	0.65	****	-1.00***
49	-0.93*	-0.30	-0.72	-0.88*	-0.21
50	-0.24	-0.04	0.38	-0.07	0.04
51	-0.20	0.35	0.37*	0.09	0.11
52	0.08	-0.07	0.17	0.54	0.59*
53	-0.08	0.67**	0.67***	0.63*	0.67
54	1.00	-0.34	-0.05	0.33	0.17
55		1.00	0.53*	0.95**	0.54*
56			1.00	0.85***	-0.03
57				1.00	0.79*
58					1.00

*p .05 **p .01 ***p .001 ****Coefficient could not be computed

[1]These coefficients are based on an extremely small N, therefore, while highly correlated, they are insignificant.

[2]Because the N was highly variable for each correlation, significant coefficients of 1.00 and -1.00 occur. These correlations can be disregarded because of extremely small N. Similarly, numerous coefficients indicate strong correlations but are not significant due to extremely small N.

Table 23

Pearson Correlation Matrix for Minor Life Events[1]
(Figures have been rounded to two significant places)

Event / Event #s	59	60	61	62	63	64	65	66	67	68
59. Briefing supervisors	1.00	0.07	-0.14	0.62*	0.34*	0.30	0.23	-0.01	0.22	0.34
60. Job requires much traveling		1.00	0.61	0.32	0.42	-0.46	0.12	0.44	0.04	0.54
61. Car problems			1.00	0.32	0.32	0.52*	0.53*	0.25	0.31	0.49**
62. Dealing with financial problems of close-ones				1.00	0.02	-0.19	0.65*	-0.33	0.44	0.53*
63. Home maintenance					1.00	0.69**	0.38*	0.14	0.50*	0.49**
64. Supervising peers						1.00	0.07	0.26	0.69*	0.30
65. Driving in rush hour traffic							1.00	-0.15	0.05	0.40*
66. Change in daily routine								1.00	-0.12	0.33
67. Frequent social obligations									1.00	0.46
68. Misplacing or losing things										1.00

*p < .05 **p < .01

[1]Because the N was highly variable for each correlation, significant coefficients of 1.00 and -1.00 occur. These correlations can be disregarded because of extremely small N. Similarly, numerous coefficients indicate strong correlations but are not significant due to extremely small N.

Table 24

Pearson Correlation Matrix for Continuous Life Events[1]
(Figures have been rounded to two significant places)

Event / Event #s	69	70	71	72	73	74	75	76	77
69. Responsibility of being a parent	1.00	0.49**	0.65***	0.34	0.16	0.37	0.35	0.21	0.56*
70. Family bickering		1.00	0.56**	0.46*	0.41*	0.24	0.22	0.54	0.38
71. Responsibility of marriage			1.00	0.42*	0.33*	0.42*	0.29	0.66**	0.48*
72. Uncomfortable job environment				1.00	0.60***	0.86***	0.12	-0.10	0.01
73. Job responsibility and pressures					1.00	0.55**	0.23	0.11	0.28
74. Inability to accomplish job						1.00	0.62	1.00***	0.27
75. Continuous financial problems							1.00	0.77*	0.82**
76. Continuous church responsibilities								1.00	0.97***
77. Frequent recreation routine (daily workout)									1.00
78. Chronic personal medical problem									
79. Chronic medical problem of close-one									
80. Eating or drinking too much									

Table 24 (Continued)

Event	Event #s	78	79	80	81	82	83
69		-0.39	0.45*	0.18	0.48***	0.47**	0.04
70		-0.12	0.54*	0.06	0.56**	0.49**	0.15
71		-0.06	0.41*	0.43*	0.58***	0.70***	0.05
72		0.10	0.11	0.40	0.47**	0.22	0.19
73		-0.03	0.50**	0.41*	0.48***	0.40**	0.14
74		0.35	0.12	0.49	0.44**	0.43	0.22
75		0.69	0.16	0.40	0.38*	0.54*	0.21
76		0.84*	-0.02	-1.00***	0.41	0.70**	0.87
77		0.40	0.42	0.39	0.58**	0.50*	0.37
78		1.00	0.06	-0.06	-0.04	0.14	-0.48
79			1.00	0.69**	0.28	0.20	-0.26
80				1.00	0.44*	0.31	0.56

Table 24 (Continued)

Event	Event #s	80	81	82	83
81. Maintaining physical appearance/self-image			1.00	0.58***	0.28
82. Maintaining life style				1.00	0.04
83. Pressures of attending school/training					1.00

*p < .05

**p < .01

***p < .001

[1]Because the N was highly variable for each correlation, significant coefficients of 1.00 and -1.00 occur. These correlations can be disregarded because of extremely small N. Similarly, numerous coefficients indicate strong correlations but are not significant due to extremely small N.

SELECTED BIBLIOGRAPHY

A. REFERENCES CITED

1. Bieliauskas, Linas A. Stress and Its Relationship to Health and Illness. Boulder CO: Westview Press, Inc., 1982.

2. Brown, G. M., D. S. Schalch, and S. Reichlin. "Patterns of Growth Hormone and Cortisol Responses to Psychological Stress in the Squirrel Monkey," Endocrinology, Vol. 88 (1971), pp. 956-963.

3. Chaplan, R. D., S. Cobb, and R. P. French, Jr. "White Collar Work Load and Cortisol: Disruption of a Circadian Rhythm by Job Stress?" Journal of Psychosomatic Research, Vol. 23 (1979), pp. 181-192.

4. Chiriboga, D. A., and H. Dean. "Dimensions of Stress: Perspectives From a Longitudinal Study," Journal of Psychosomatic Research, Vol. 22 (1978), pp. 47-55.

5. Cleary, P. J. "A Checklist for Life Event Research," Journal of Psychosomatic Research, Vol. 24 (1980), pp. 199-207.

6. Cline, D. W., and J. J. Chosy. "A Prospective Study of Life Changes and Subsequent Health Changes," Archives of General Psychiatry, Vol. 27 (July 1972), pp. 51-53.

7. Davidson, Marilyn J., and Cary L. Cooper. "A Model of Occupational Stress," Journal of Occupational Medicine, Vol. 23, No. 8 (August 1981), pp. 564-574.

8. Dohrenwend, Barbara S., and Bruce P. Dohrenwend. "A Brief Historical Introduction to Research on Stressful Life Events," in Barbara S. Dohrenwend and Bruce P. Dohrenwend, eds., Stressful Life Events: Their Nature and Effects. New York: John Wiley and Sons, Inc., 1974.

9. Fye, Captain Samuel P., USAF, and First Lieutenant Charles W. Staton, USAF. "Individual and Organizational Variables' Relationship to Coronary Heart Disease." Unpublished master's thesis. LSSR 3-81, AFIT/LS, Wright-Patterson AFB OH, June 1981.

10. Garrity, T. F., M. B. Marx, and G. W. Somes. "The Relationship of Recent Life Change to Seriousness of Later Illness," Journal of Psychosomatic Research, Vol. 22 (1978), pp. 7-12.

11. Goldband, Steve, Edward S. Katlin, and Marie A. Morell. "Personality and Cardiovascular Disorder--Steps Toward Demystification," in Irwin G. Sarason and Charles D. Spielberger, eds., Stress and Anxiety. Washington DC: Hemisphere Publishing Corporation, 1979.

12. Grant, Igor, and others. "Scaling Procedures in Life Events Research," Journal of Psychosomatic Research, Vol. 22 (1978), pp. 525-530.

13. Hansson, R. O. "Birth Order and Life Stress," The Journal of Social Psychology, Vol. 109 (1972), pp. 305-306.

14. Harmon, D. K., M. Masuda, and T. H. Holmes. "The Social Readjustment Rating Scale: A Cross-cultural Study of Western Europeans and Americans," Journal of Psychosomatic Research, Vol. 14 (1970), pp. 391-400.

15. Holmes, T. H., and M. Masuda. "The Social Readjustment Rating Scale of Japanese and Americans," Journal of Psychosomatic Research, Vol. 11 (1967), pp. 227-237.

16. _____, and T. S. Holmes. "How Change Can Make Us Ill," Blue Print for Health, Blue Cross Association, 1974, pp. 66-75.

17. _____, and M. Masuda. "Magnitude Estimates of Social Readjustments," Journal of Psychosomatic Research, Vol. 11 (1967), pp. 219-225.

18. _____, and R. H. Rahe. "The Social Readjustment Rating Scale," Journal of Psychosomatic Research, Vol. 11, pp. 213-218.

19. Holdern, Anthony. Tranquility Denied--Stress and Its Impact Today. Hong Kong: Rigby Limited, 1976.

20. Hurst, Michael W., C. D. Jenkins, and Robert M. Rose. "The Assessment of Life Change Stress: A Comparative and Methodological Inquiry," Psychosomatic Medicine, Vol. XL, No. 3 (May 1978), pp. 126-141.

21. Ivancevich, John M., and Michael T. Matteson. Stress and Work--A Managerial Perspective. New York: Scott, Foreman and Company, 1980.

22. Johnson, James H., and Irwin G. Sarason. "Moderator Variables in Life Stress Research," in Irwin G. Sarason and Charles D. Spielberger, eds., Stress and Anxiety. Washington DC: Hemisphere Publishing Corporation, 1979.

23. Kopin, I. J. "Catecholamines, Adrenal Hormones, and Stress," Hospital Practice, March, 1976, pp. 49-55.

24. Kritchevsky, D., R. Paoletti, and W. Holms. Drugs, Lipid Metabolism, and Atherosclerosis. New York: Plenum Press, 1978.

25. Lazarus, Richard S. "Little Hassles Can Be Hazardous to Health," Psychology Today, July (1981), pp. 58-62.

26. Lei, H., and H. A. Skinner. "A Psychometric Study of Life Events and Social Readjustment," Journal of Psychosomatic Research, Vol. 24 (1980), pp. 57-65.

27. Lunghi, M. E., P. McC. Miller, and W. M. McQuillan. "Psychosocial Factors in Osteoarthritis of the Hip," Journal of Psychosomatic Research, Vol. 22 (1978), pp. 57-63.

28. Masuda, Minoru, and Thomas H. Holmes. "Life Events: Perceptions and Frequencies," Psychosomatic Medicine, Vol. XL, No. 3 (May 1978), pp. 236-261.

29. Mendels, J., and N. Weinstein. "The Schedule of Recent Experiences," Psychosomatic Medicine, Vol. 34 (November-December 1972), pp. 527-531.

30. National Center for Health Statistics. Vital Statistics of the United States, 1978, Vol. 11, Part B. DHHS Pub. No. (PHS) 82-1102. Public Health Service, Washington: Government Printing Office, 1982.

31. National Safety Council. Accident Facts 1978 Edition. National Safety Council, Chicago IL, 1978.

32. Paykel, E. S., and others. "Life Events and Depression," Archives of General Psychiatry, Vol. 21 (1969), pp. 753-760.

33. _____, B. A. Prusoff, and E. H. Uhlenhuth. "Scaling of Life Events," Archives of General Psychiatry, Vol. 25 (October 1971), pp. 340-347.

34. _____, G. L. Klerman, and B. A. Prusoff. "Treatment Setting and Clinical Depression," Archives of General Psychiatry, Vol. 22 (1970), pp. 11-21.

35. Rabkin. J. G., and E. L. Struening. "Life Events, Stress, and Illness," Science, Vol. 194 (1976), pp. 1013-1020.

36. Rahe, R. H. "Editorial: Life Change Measurement Clarification," Psychosomatic Medicine, Vol. 40 (March 1978), pp. 95-98.

37. _____, J. D. McKean, and R. J. Arthur. "A Longitudinal Study of Life-Change and Illness Patterns," Journal of Psychosomatic Research, Vol. 10 (1967), pp. 355-366.

38. _____. "Multi-cultural Correlations of Life Change Scaling: American, Japan, Denmark and Sweden," Journal of Psychosomatic Research, Vol. 13 (1969), pp. 191-195.

39. _____, J. L. Mahan, Jr., and R. J. Arthur. "Prediction of Near Future Health Change from Subjects' Preceding Life Changes," Journal of Psychosomatic Research, Vol. 14 (1970), pp. 401-406.

40. _____, and others. "Social Stress and Illness Onset," Journal of Psychosomatic Research, Vol. 8 (1964), pp. 35-43.

41. Rubin, R. T., E. K. E. Gunderson, and R. J. Arthur. "Life Stress and Illness Patterns in the U.S. Navy VI. Environmental, Demographic and Prior Life Change Variables in Relation to Illness Onset in Naval Aviators During a Combat Cruise," Psychosomatic Medicine, Vol. 34 (November-December 1972), pp. 533-546.

42. _____, and others. "Prior Life Change and Illness Onset in an Attack Carriers Crew," Archives of Environmental Health, Vol. 19 (November 1969), pp. 753-757.

43. _____, and others. "Serum Uric Acid, Cholesterol, and Cortisol Levels: Interrelationships in Normal Men Under Stress," Archives of Internal Medicine, Vol. 125 (1970), pp. 815-819.

44. Sarason, Irwin G., James H. Johnson, and Judith M. Siegel. "Development of Life Experiences Survey," in Irwin G. Sarason and Charles D. Spielberger, eds., Stress and Anxiety. Washington DC: Hemisphere Publishing Corporation, 1979.

45. Seyle, Hans. The Stress of Life. New York: McGraw-Hill Book, Co., 1978.

46. Spilken, A. Z., and M. A. Jacobs. "Prediction of Illness Behavior from Measure of Life Crisis, Manifest Distress, and Maladaptive Coping," Psychosomatic Medicine, Vol. 33, No. 3 (May-June 1971), pp. 251-264.

47. Suls, J., J. W. Gastorf, and S. H. Witenberg. "Life Events, Psychological Distress of the Type A Coronary-Prone Behavior Pattern," Journal of Psychosomatic Research, Vol. 23 (1979), pp. 315-319.

48. Theorell, T. and others. "A Longitudinal Study of 21 Subjects with Coronary Heart Disease: Life Changes, Catecholomine Excretion and Related Biochemical Reactions," Psychosomatic Medicine, Vol. 34 November-December 1972), pp. 505-516.

49. Toffler, Alvin. Future Shock. New York: Random House, Inc., 1970.

50. Totman, R., and others. "Predicting Environmental Colds in Volunteers from Different Measures of Recent Life Stress," Journal of Psychosomatic Research, Vol. 24 (1980), pp. 155-163.

51. Troxler, Colonel Robert G., USAF. Chief of Clinical Pathology, Brooks Medical Research Institute, Brooks AFB TX. Video cassette, "Stress and Executive Responsibility."

52. U.S. Department of Commerce. Statistical Abstract of the United States: 1981. 102d ed. Washington: Government Printing Office, 1981.

53. U.S. Department of Labor, Bureau of Labor Statistics. Occupational Injuries and Illnesses in the United States by Industry, 1974. Bulletin 1932. Washington: Government Printing Office, 1976.

54. Volicer, B. J., and L. Volicer. "Cardiovascular Changes Associated with Stress During Hospitalization," Journal of Psychosomatic Research, Vol. 22 (1978), pp. 159-168.

55. Webb, L. J., and R. Allen. "Sex Differences in Mental Health," Journal of Psychology, Vol. 101 (1979), pp. 89-96.

56. Wolff, Harold G. Stress and Disease. 2d ed. Revised and edited by Stewart Wolf and Helen Goodell. Springfield IL: Charles C. Thomas Publisher, 1968.

B. RELATED SOURCES

Birley, J. L. T. "Stress and Disease," Journal of Psychosomatic Research, Vol. 16 (1972), pp. 235-240.

Buckley, J. P. "Physiological Effects of Environmental Stimuli," Journal of Pharmaceutical Sciences, Vol. 61 (1972), pp. 1175-1188.

Dohrenwend, B. S. "Life Events as Stressors: A Methodological Inquiry," Journal of Health and Social Behavior, Vol. 14 (1973), pp. 167-175.

Fraser, T. M. "Men Under Stress," Science and Technology, Vol. 82, No. 73 (1968), pp. 33-44.

Grodon, R. E. "Psychiatric Screening through Multiphasic Health Testing," American Journal of Psychiatry, Vol. 128, No. 5 (November 1971), pp. 559-563.

Hawkins, N. G., R. Davies, and T. H. Holmes. "Evidence of Psychosocial Factors in the Development of Pulmonary Tuberculosis," American Review of Tuberculosis and Pulmonary Diseases, Vol. 75 (1957), pp. 768-780.

Holmes, T. H., and T. S. Holmes. "Short-Term Intrusions into the Lifestyle Routine," Journal of Psychosomatic Research, Vol. 14 (1970), pp. 121-132.

Hull, D. "Life Circumstances and Physical Illness: A Cross Disciplinary Survey of Research Content and Method for the Decade 1965-1975," Journal of Psychosomatic Research, Vol. 21 (1977), pp. 115-137.

Jacobs, M. A., and others. "Life Stress and Respiratory Illness," Psychosomatic Medicine, Vol. 32 (May-June 1970), pp. 233-242.

Kositskii, G. I., and V. S. Smirnov. The Nervous System and "Stress." Washington DC: National Aeronautics and Space Administration, 1972.

Levine, J. B., and others. "Recent Life Changes and Accidents Aboard an Attack Carrier," Military Medicine, Vol. 141 (1977), pp. 469-471.

Lipowski, Z. J., D. R. Lipsitt, and P. C. Whybrown. Psychosomatic Medicine: Current Trends and Clinical Applications. NY: Oxford University Press, 1977.

McQuade, W. "What Can Stress Do To You?" Fortune, January 1977, pp. 102-141.

Minter, R. E., and C. P. Kimball. "Life Events and Illness: A Review," Psychosomatics, Vol. 19 (1978), p. 334.

Nelson, P., and others. "Variables in the Reporting of Recent Life Changes," Journal of Psychosomatic Research, Vol. 16 (1972), p. 465.

Rahe, Richard H. "Epidemiological Stress of Life Change and Illness," International Journal of Psychiatry in Medicine, Vol. 6 (1975), pp. 133-146.

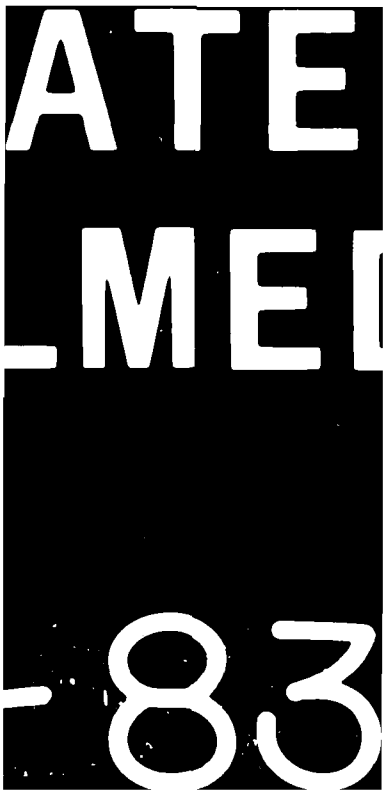
_____. "Life Crisis and Health Change," in Charles Thomas, Psychotropic Drug Response: Advances in Prediction. Springfield IL, 1969, pp. 92-125.

Sarason, I. G., C. DeMonchaux, and T. Hunt. "Methodology Issues in the Assessment of Life Stress," in L. Levi, ed., Emotions - Their Parameters and Measurement. NY: Raven Press, 1975, p. 499.

Stone, A. A., and J. M. Neale. "Life Event Scales: Psychophysical Training and Rating Dimension Effects on Event-Weighting," Journal of Consulting and Clinical Psychology, Vol. 46 (1978), pp. 849.

Wershow, Harold J., and George Reinhart. "Life Change and Hospitalization - A Heretical View," Journal of Psychosomatic Research, Vol. 18 (1974), pp. 393-401.

Zuckerman, M. "Perceptual Isolation as a Stress Situation," Archives of General Psychiatry, Vol. 11 (1964), pp. 255-276.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